Automation and control

AS-Interface cabling system

Catalogue
January

05

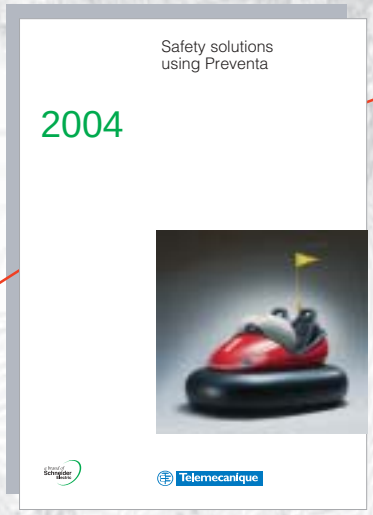
a brand of Schneider Electric

Telemecanique

Art. 802731 - MKTED204073EN

Human/Machine dialogue
Communication

Art. 67341 - MKTED203111EN



Control and Protection,
Detection,
Automation,
Human/Machine dialogue

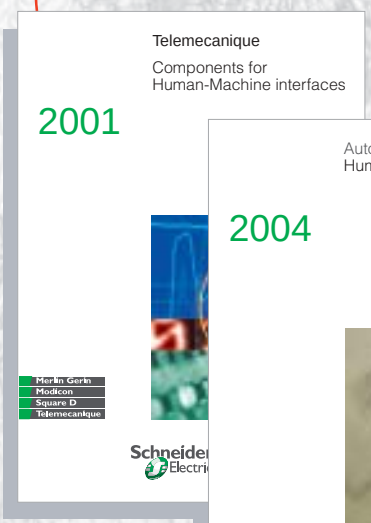
Art. 804961 - MKTED204121EN

Control and Protection,
Detection,
Automation,
Human/Machine dialogue,
Communication

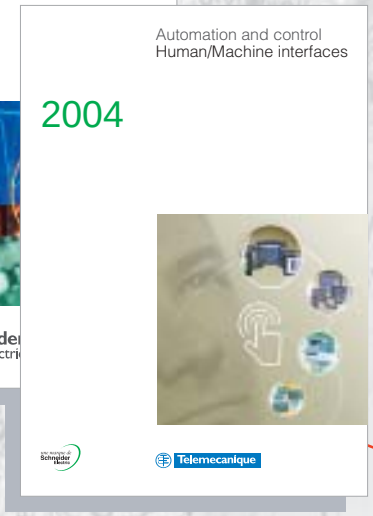
An overview of the product range

Control and protection,
Detection,
Automation,
Human/Machine dialogue,
Communication,
Supervision,
Panel-building and cabling accessories

Control and signalling units
Art. 28697 - MKTED299014EN

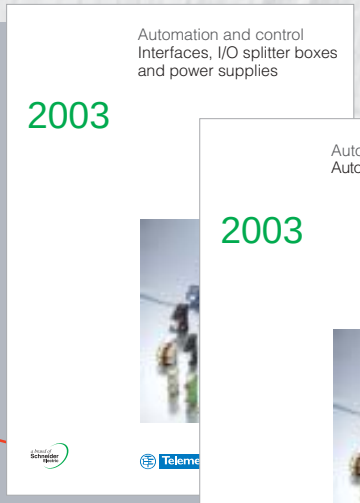


Terminals and display units
Art. 96949 - MKTED2040401EN

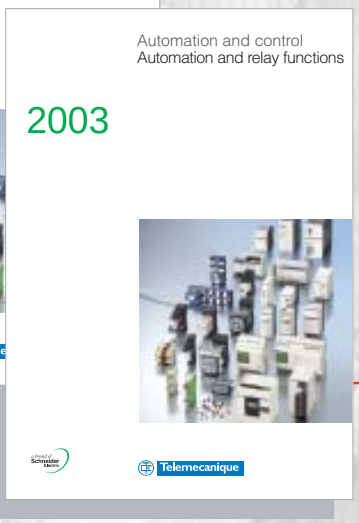


Human/Machine dialogue
Supervision

Art. 70263 - MKTED203113EN



Art. 70455 - MKTED204011EN



Panel-building and cabling accessories
Automation

Not all products shown in this catalogue are available in every country.
Check individual country's web site or Sales Office for product availability.
See on: www.schneider-electric.com.

Art. 804818 - MKTED204101EN

Automation and control
IP 20 Distributed I/O
Advantys STB

2004

Telemecanique

AUTC201104124EN

Modicon Momentum
automation platform

2002

Schneider Electric

Art. 802621 - MKTED204071EN

Automation and control
Automation platform
Modicon Quantum
and Unity - Concept
Proworx software

2004

Telemecanique

Art. 802625 - MKTED204072EN

Automation and control
Automation platform
Modicon Premium
and Unity - PL7 software

2004

Telemecanique

Art. 70984 - MKTED204012EN

Automation platform
Modicon TSX Micro
and PL7 software

2004

Telemecanique

Automation, Communication

Art. 960015 - DIA1ED2040506EN

Automation and control
Telemecanique
The essential

2004

Telemecanique

Art. 66692 - DIA7ED20310006EN

Motion control
Lexium

2004

Art. 61233 - DIA7ED2030902EN

Twin Line
Motion control

2003

Art. 802660 - MKTED204091EN

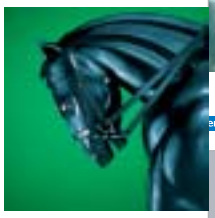
Soft starters and
variable speed drives

2004

Art. 27501 - MKTED201001EN

Motor starter solutions
Control and protection
components

2001



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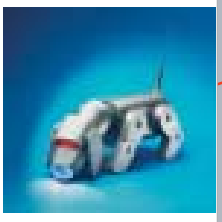
Control and protection

Art. 54752 - MKTED203031EN

Global Detection

Electronic and
electromechanical sensors

2003



Telemecanique

Detection

AS-Interface cabling system

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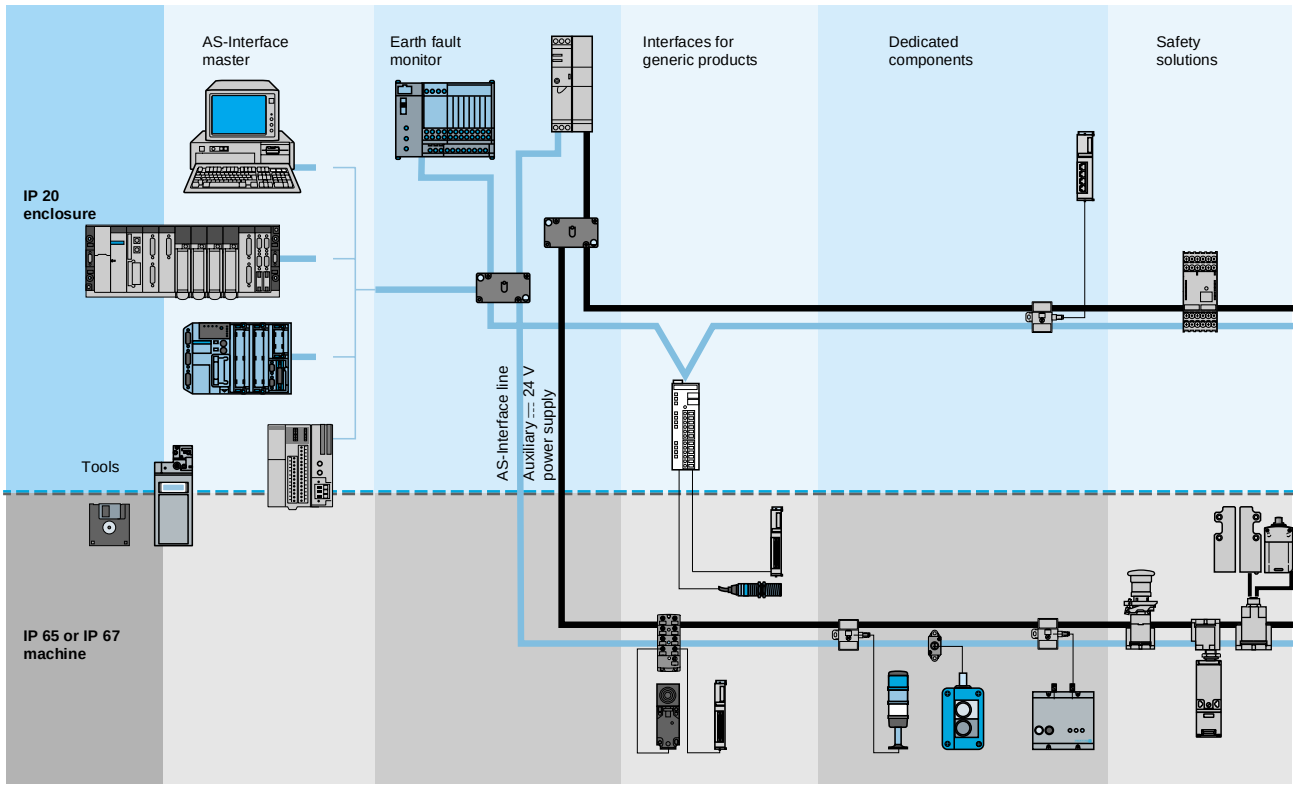
AS-Interface cabling system

The AS-Interface concept

■ AS-Interface is a cabling system that meets the needs of industrial automation system integration. It allows fast connection of sensors and actuators to the programmable controller by means of a single cable that ensures both transmission of data and supply of power to the sensors. The AS-Interface cabling system is a cost-effective alternative to parallel wiring between the PLC and the sensors/actuators.
■ AS-Interface is today widely used in many sectors of industry:
□ assembly machines,
□ conveyor applications,
□ mechanical handling,
□ etc.
■ AS-Interface is an open industry standard supported by the AS-International association. This association, founded in 1991, counts among its members not only Schneider Electric, but also leading manufacturers of sensors, actuators, programmable controllers and connection accessories.
■ AS-Interface is recognized world-wide and all products conform to standards EN 50295 and IEC 62026-2.
■ AS-Interface is an open system and guarantees interchangeability and interoperability between the various products in the market. This guarantee is assured by AS-Interface certification.

AS-Interface architecture



AS-Interface cabling system

The advantages of AS-Interface

Simplicity

The simplicity of the AS-Interface cabling system is due to:

- Use of a single cable for connecting all the sensors in an automation system.
- Management of communications incorporated in the products.

Reduction in costs

Costs can be reduced by up to 40% as a result of:

- Reduced design, installation, setting-up and implementation times.
- Space saved in enclosures due to more compact products and the elimination of intermediate enclosures, since the majority of functions can be remotely located on the machine.
- Elimination of control cable runs and reduction of the amount of cable ducting required.

Maximum safety

AS-Interface helps to improve machine reliability, operational availability and safety:

- Wiring errors are no longer possible.
- No risk of electrical connection failure.
- High immunity to electromagnetic interference (EMC).
- The safety function of the machine can be totally integrated with AS-Interface "Safety at work".

AS-Interface components

Interfaces for generic products

These allow any standard product (sensor, actuator, motor starter, etc.) to be connected on the AS-Interface line. They provide great freedom in the selection of sensors, actuators, etc. and are particularly suitable for modification or upgrading of machines previously wired in the traditional way.

These interfaces are available for installation in enclosures (IP 20) or for direct mounting on the machine (IP 65 or IP 67).

Dedicated interfaces and components

Dedicated interfaces (communication module, …) allow communication with the AS-Interface line.
Dedicated components incorporate an interface and can therefore be connected directly on the AS-Interface line.
They allow significantly faster wiring, but provide less freedom of choice than interfaces for generic products.

The master

This is the central component of the system. Its function is to manage the exchange of data with interfaces and components (also called slaves) distributed in the installation. It can accept a maximum of 31 V1 interfaces and components (max. cycle time = 5 ms) and 62 V2.1 interfaces and components (max. cycle time = 10 ms).

The master may be:

- Integrated in a programmable controller, for example in the form of an extension.
- Connected to a field bus (for example Modbus). This is called a gateway.

AS-Interface cabling system

AS-Interface components (continued)

The AS-Interface power supply

Provides a PELV (Protective Extra Low Voltage) of 29.5 to 31.6 V for the interfaces and components supplied from the AS-Interface line. It ensures disconnection of communication data. It is protected against overload and short-circuits. **Only this type of power supply unit can be connected to the AS-Interface line.** Since the current in the AS-Interface cable is limited, it is sometimes necessary to supply certain circuits, in particular the actuators, directly or via the interface outputs, with a separate, standard ⎓ 24 V supply unit. In this case, a dual supply can be used: AS-Interface and ⎓ 24 V.

The ribbon cable

The yellow cable, connected to the AS-interface power supply, performs both of the following functions:

- Transmission of data between the master, the dedicated components, the interfaces and the safety products (slaves).
- Supply of power to the sensors.

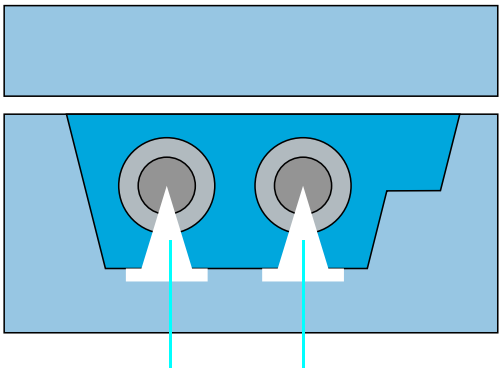
The black cable, connected to the ⎓ 24 V auxiliary power supply, provides power supply for the actuators, but also, on certain interfaces and components, for the sensors (isolated inputs).

The mechanical profile of these cables makes it impossible to reverse the polarity. The material used also allows fast and reliable connection of the various components, interfaces and accessories by means of insulation displacement connectors (IDC). When products are removed - for example when wiring needs to be modified - the cable resumes its original form due to its self-sealing sheath.

These cables can be used both in an enclosure and on the machine. The maximum operational current is 8 A.

The ribbon cables are available in 2 types of material:

- Rubber, for standard applications and maximum cable flexibility.
- TPE, for applications where the cable is installed in an environment with splashing oil.



Ribbon cable with mechanical profile

IDC connector

AS-Interface cabling system

AS-Interface components (continued)

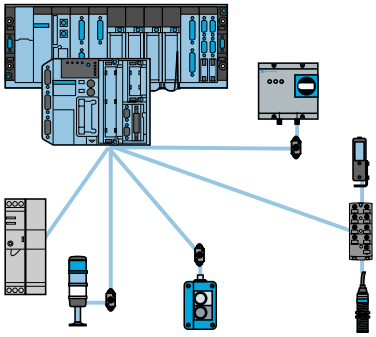
Safety solutions on AS-Interface	Standard process information and information relating to safety can now be transmitted over the same cable. Capable of managing safety functions up to level 4 of standard EN 60954-1, the AS-Interface "Safety at work" system meets the needs of the most common safety applications, such as: ■ Emergency stop monitoring with instantaneous break contacts (stop category 0). ■ Emergency stop monitoring with delayed break contacts (stop category 1). ■ Monitoring of switches with and without interlocking. ■ Monitoring of light curtains. Parameters for options relative to the selected safety function (such as, for example, start button monitoring) may be set for all pre-defined, certified functions. Safety is incorporated into the AS-Interface system by adding a safety monitor and safety interfaces connected, together with other standard AS-Interface components, on the yellow cable. Safety information is only exchanged between the safety monitor and the safety interfaces. This is transparent for the other standard AS-Interface components. Based on this principle, AS-Interface systems that are already installed can be updated with safety functions without having to replace the existing components (masters, input/output interfaces, power supplies, etc.). Safety circuits are diagnosed readily, and with no additional wiring, by the standard AS-Interface master communicating with the safety monitor(s) via the yellow cable.
AS-Interface connection accessories	These are used for connecting components to the ribbon cables and for creating tap-offs. Certain components, however, such as interfaces for generic products with IDC connectors, can be connected directly on the ribbon cable without any need for accessories.
The addressing terminal	Since AS-Interface components are connected in parallel on the AS-Interface cable, it is necessary to assign an address to each of them (interfaces, motor starters, dedicated components). This function is performed by the addressing terminal which can be connected to the various products by means of connection cables.

AS-Interface cabling system

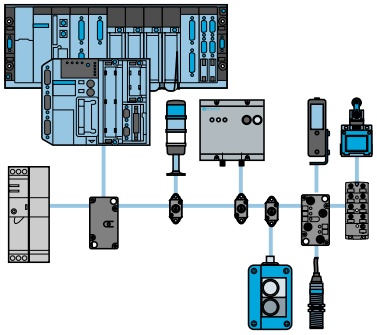
The topology of the AS-Interface cabling system is unrestricted: point-to-point, line, tree, ring, etc...

This lack of restrictions enables the most direct connections to be made between the AS-Interface system and the various sensors and actuators in an installation. The maximum length of the AS-Interface line is 100 m (including main runs and tap-off runs). Runs of up to 300 m are possible using repeaters (signal regenerators).

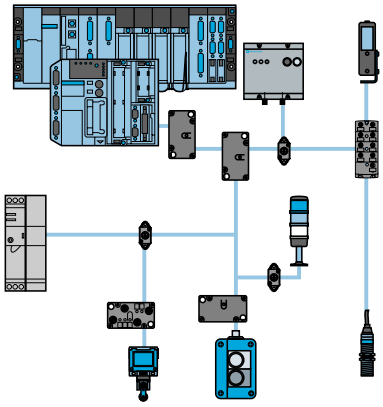
Point-to-point



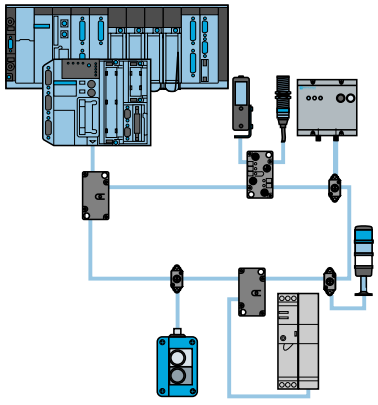
Line



Tree



Ring



AS-Interface cabling system

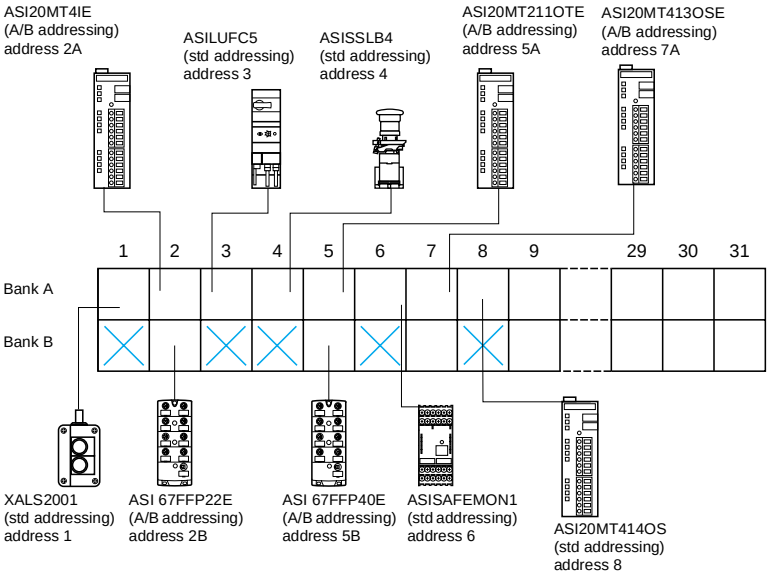
AS-Interface system versions

The original version of the AS-Interface system (V1) has been followed by version V2.1, which incorporates the following enhancements:

- Possibility of connecting a maximum of 62 slaves, compared with 31 previously, by means of a 2-bank addressing system (called extended or A/B addressing).
- Possibility of transmitting a "peripheral fault" message to the AS-Interface master without totally inhibiting the slave (continuity of service). This means that communication faults can be separated from faults associated with the product peripherals.
- Management of analogue slaves.

Important: products that conform to the V2.1 specification do not necessarily include all these enhancements.

Extended or A/B addressing



AS-Interface masters developed according to the V2.1 specification have 2 addressing banks, A and B.

- V2.1 slaves with extended addressing (A/B) connected to this type of master only occupy one of the 2 banks (A or B), allowing up to 62 slaves to be addressed.
- V2.1 slaves with standard addressing or V1 slaves can only be addressed in bank A and bank B of the same address is no longer available.

It is quite possible to mix V1, V2.1 standard addressing and V2.1 extended addressing slaves, but in this case the total number of slaves will be less than 62.

Schneider Electric PLC programming software packages automatically generate the maximum number of slaves possible, according to the type of addressing of the products (standard or extended).

The scan time for slaves with extended addressing will be twice that of slaves with standard addressing.

Configurations with 4 inputs/4 outputs and with 4 outputs cannot be achieved with extended addressing; they are replaced by configurations with 4 inputs/3 outputs and with 3 outputs.

AS-Interface cabling system

AS-Interface versions (continued)

Peripheral fault

This new function allows any problem external to the AS-Interface cabling system to be signalled to the PLC and, in particular:

- A short-circuit in the sensor supply.
- Absence of auxiliary voltage.
- Short-circuit or overload on the outputs.

On V1 slaves, faults of this type result in total inhibition of the slave, which is no longer "seen" by the PLC.

Analogue

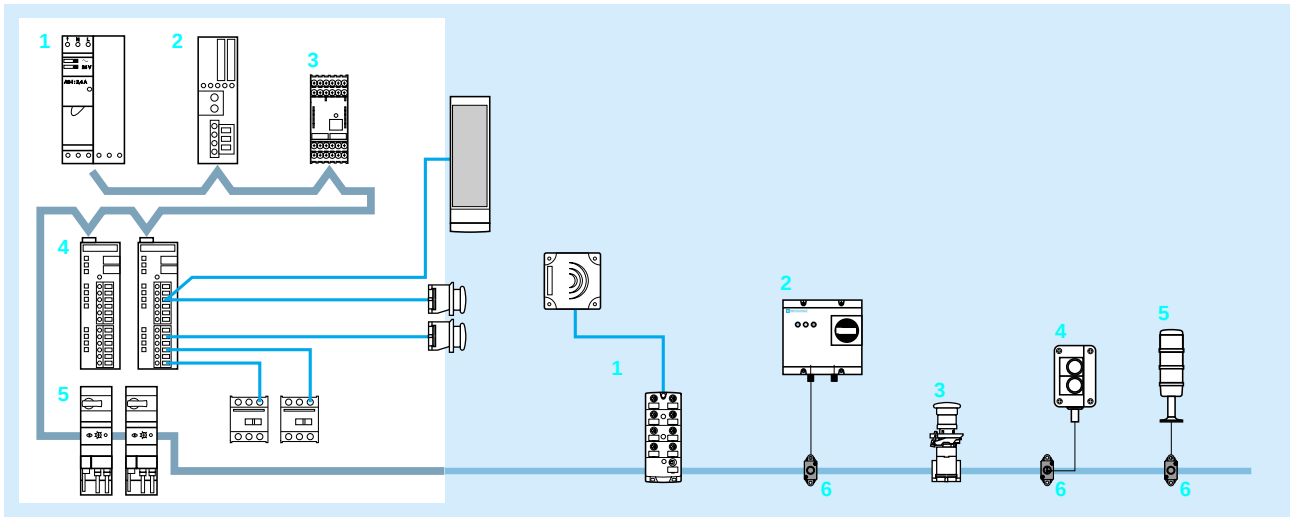
Two new profiles make it possible to use slaves with analogue inputs. The types of input available are:

- Voltage 0-10 V.
- Current 0-20 mA or 4-20 mA.

Compatibility between master and slave versions

	V1 slaves	V2.1 slaves with standard addressing	V2.1 slaves with standard addressing	V2.1 analogue slaves
V1 masters	Compatible	Compatible but peripheral faults are not signalled to the master	Not compatible	Not compatible
V2.1 masters	Compatible	Compatible	Compatible	Compatible

Example of machine cabled with the AS-Interface system



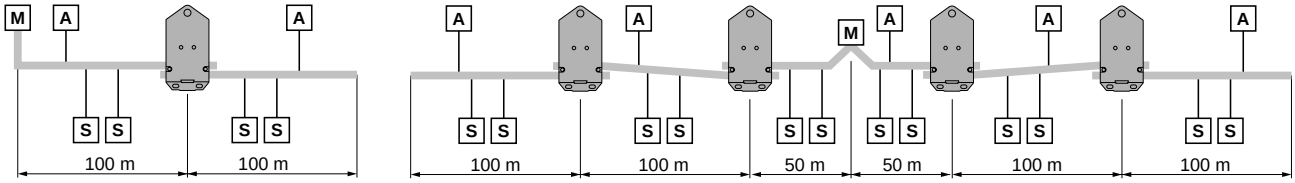
1 Power supplies ASI ABL●●●●●
2 Master TWD NOI 10M3
3 Safety monitors ASI SAFEMON●
4 IP 20 interfaces for generic products ASI 20M●●●
5 Interfaces for TeSys model U starters: ASI LUFC5

1 IP 67 interfaces for generic products ASI 67F●P●●●
2 Motor starters LF1/LF2/LF7/LF8
3 Interface for Emergency stop ASI SSLB4
4 Control stations XAL S200●
5 Illuminated indicator banks XVB C21●
6 Tap-offs for ribbon cable: XZ CG●●●●, ASI DCP●●●●

AS-Interface cabling system

Setting-up

Products connected to the As-Interface cable	Only the “AS-Interface +” and “AS-Interface -” terminals of a product may be connected to the AS-Interface cable.
Earthing	The earth terminals (Shd or Gnd) on products **must** be connected to the machine earth and to the enclosure earth, and these points must be themselves connected to earth: ■ AS-Interface supply. ■ Auxiliary supply. ■ Earth fault monitor. ■ Safety monitor. ■ AS-Interface master. ■ Programmable controller rack. In addition to double insulation of the AS-Interface supply, this condition ensures: ■ Safety of personnel on an AS-Interface line. ■ Good resistance to electromagnetic interference (EMC).
Connection of power supplies	■ If a switch has to break the AS-Interface supply, then it must be located upstream of the AS-Interface supply: **the switch must not be installed on the AS-Interface line.** ■ If a switch has to break a programmable controller’s supplies, then this switch must be common to the PLC's AS-Interface supply and to its auxiliary supply (24 V or 220 V). This makes it possible to ensure that both supplies are switched on and off at the same time. ■ It is recommended that AS-Interface supplies be installed close to the programmable controllers.
Use of an earth fault monitor	In order to conform to machine standard EN 60204-1 (in particular paragraph 9.4.3.1 concerning earth faults), the AS-Interface system must include an earth fault monitor. The earth fault monitor may be: ■ Either separate from the power supply (example: RMOPAS101), ■ Or built into the power supplies (example: ASI ABLD300●).
Cable lengths	**AS-Interface cables** We recommend use of the yellow ribbon cable (see page 8). The maximum length of an AS-Interface run is 100 m, which can be extended to 200 m by using one repeater (see page 10) or to 300 m with 2 repeaters. It is not possible to exceed a distance of 300 m between the master and the most distant slave. By placing the master in the middle of the network, runs of up to 500 m are possible.



M = Master module
A = Supply
S = Interface or component

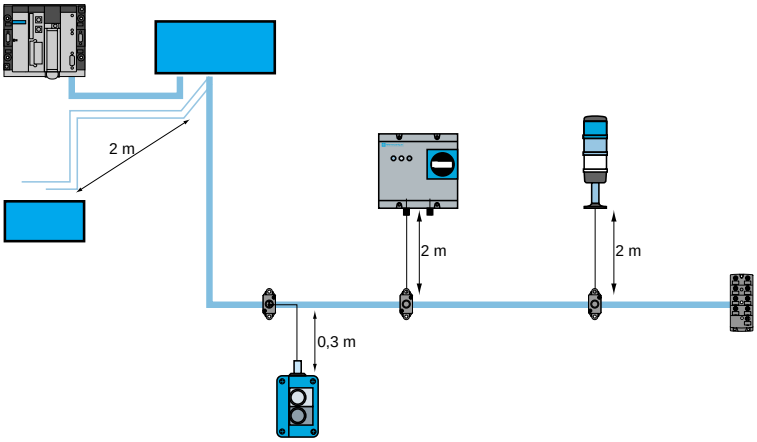
AS-Interface cabling system

Setting-up (continued)

Cable lengths (continued)

Calculating cable lengths

The total length of cable and wires connected to the AS-Interface + terminals and AS-Interface - terminals of the master must be carefully counted, both inside and outside the enclosure, including the lengths of tap-offs in cases where AS-Interface components are not installed directly on the yellow cable using the IDC system. Lengths of tap-off cables must be counted twice. We therefore recommend using short tap-off runs and, wherever possible, using products installed directly on the yellow cable via IDC connectors (example: IP 67 interfaces, references ASI 67FFP●●●).



Total length of ribbon cable	= 40 m = Lc
Total length of round wire	= 2 m = Lf
Total length of tap-offs	= 4.3 m = Ld
Length of network	= Lc + Lf + 2 x Ld = 50.60 m

Cables between sensors/actuators and interface inputs

Sensors/actuators must be supplied with power directly at the AS-Interface interface terminals or connectors. The sensor supply must not be connected to any potential. Maximum lengths are:

- Between safety sensors and safety interfaces: 3 m (2 m recommended).
- Between standard sensors/actuators and interfaces: 10 m.

AS-Interface cabling system

Setting-up (continued)

Cable routing	■ Do not route the AS-Interface cable with other cables in the same strand. In exceptional circumstances, it is permissible to run cables carrying low power signals (for example: wires connected to start/stop buttons) close to the AS-Interface + and AS-Interface - cables. ■ Do not route the AS-Interface cable close to sources of interference (variator cables, etc...) including inside the enclosure. ■ To ensure symmetry, the AS-Interface cable must be laid flat in relation to the support on which it is fixed, especially if the support is in metal. □ the end of the AS-Interface cable must be protected (never leave the end of the cable open), for example by terminating the line with an IP 67 interface, □ in an enclosure, when standard wire is used for cabling AS-Interface + and AS-Interface - lines, these wires must be of the same length and must be laid in parallel. They must be spaced no more than 10 mm apart.
Limiting the interference emitted by certain products	In order to limit the electromagnetic disturbance emitted by products, a number of recommendations must be taken into account: ■ Fit frequency variators with suitable filters. ■ Use screened cables between the variator and the motor. ■ Fit inductive loads (coils of contactors, relays, brakes, solenoid valves etc.) with flywheel diodes, varistors or RC circuits. When it is not possible to completely eliminate emitted interference, is it essential to ensure that the following distances are maintained. ■ In the case of an AS-Interface installation including safety products, the AS-Interface cable or the safety input cables must be located at a distance greater than: □ **50 cm** from products which have a control circuit with inductive load (relays, contactors, coils, reversing contactors, etc...). □ **100 cm** from products such as welding machines, power circuits in general, electronic speed regulators, switch mode power supplies. ■ In the case of an AS-Interface that does not include safety products, the AS-Interface cable or standard sensor/actuator cables must be located as a distance greater than: □ **10 cm** from products which have a control circuit with inductive load (relays, contactors, coils, reversing contactors, etc...). □ **50 cm** from products such as welding machines, power circuits in general, electronic speed regulators, switch mode power supplies. In all cases, we recommend that the practical installation guidelines in the Schneider Electric EMC manual be followed (please consult your Regional Sales Office).

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□ For discrete inputs/outputs . . . . . *page 1/11*

■ Advantys, interfaces IP 67 I/O, AS-Interface V2.1

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□ Interfaces with remote M12 connector. . . . . *page 1/25*

■ Connection of sensors and actuators to Advantys ASI 67F interfaces . *page 1/32*

■ Jumper cables for connection of conventional sensors. . . . . *page 1/36*

■ Connection of sensors and actuators on the AS-Interface line

□ Compatibility table for connection of Telemecanique brand sensors . . . . . *page 1/37*

1

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20 and IP 67

Description	Analogue modular interfaces	Discrete modular interfaces
Degree of protection	IP 20	
Functions	Connection of 1 to 2 analogue sensors	Connection of 1 to 8 discrete sensors/actuators
Connection of sensors/actuators	By removable screw clamp connectors (optional spring terminal connectors)	
Supply for the inputs and sensors	Via the AS-Interface line	Via the AS-Interface line or via ⎓ 24 V external power supply
Supply for the outputs	–	Via ⎓ 24 V external power supply
Connection to the AS-Interface and auxiliary supply	By removable screw clamp connectors (optional IDC connectors)	
AS-Interface version	V2.1	
Extended addressing	No	Yes
I/O configurations	2 inputs: 0/4…20 mA or 2 inputs 0…10 V	2 inputs/1 output, 4 inputs, 4 inputs/4 outputs, 4 inputs/3 outputs
Output type	–	Relay or triac 2 A, Transistor 0.5 A
Type	**ASI 20MA●●**	**ASI 20MT●●**
Pages	1/6	1/11

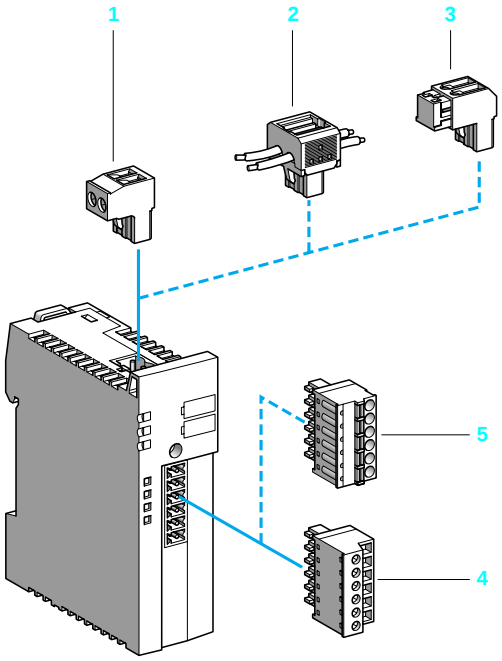
Telefast compact discrete interfaces	Discrete interfaces, direct connection	Discrete interfaces, remote connection
IP 20	IP 67	
Connection of 1 to 8 discrete sensors/actuators	Connection of 1 to 8 discrete sensors/actuators	
By removable screw connectors	By M12 connector	
Via the AS-Interface line or via ⎓ 24 V external power supply	Via the AS-Interface line	
Via ⎓ 24 V external power supply		
By removable screw connectors	Directly to the ribbon cable by IDC connectors	By M12 connector
V1	V2.1 and V1 compatible	V2.1
No	Yes	
4 inputs, 4 inputs/4 outputs, 4 outputs	4 inputs, 2 inputs/2 outputs, 4 inputs/4 outputs, 3 outputs, 4 outputs, 4 inputs/3 outputs	
Relay 2A, Transistor 0.5 A	Transistor 2 A	
ABE 8●●	**ASI 67FFP●●●**	**ASI 67FMP●●●**
Please consult your Regional Sales Office *(1)*	1/23 and 1/24	1/25

(1) Products used only for maintenance.

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Modular, for analogue inputs

1



Presentation

ASI 20MA modular interfaces enable analogue output sensors (proximity, pressure, temperature sensors...) to be connected to the AS-Interface cabling system.
Due to their particularly compact size, they are suitable for fitting in small-size enclosures as well as in larger, floor-standing enclosures.
Inputs are of the current type (0-10 mA or 4-20 mA, depending on connection) or voltage type (0-10 V), and supply to the sensors is from the AS-Interface line.
All connectors are of the removable type and are supplied with screw terminal block as standard. Quick connect terminal blocks are available as an accessory. A "Jack" connector on the front panel allows addressing of the product independently, or when installed.

Composition

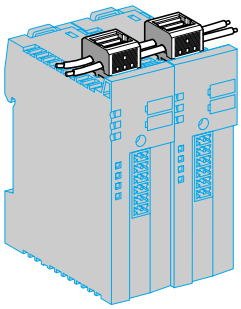
AS-Interface connection:

1 ASI 20MACC4 screw terminal block, fitted as standard.
2 ASI 20MACC1 insulation displacement connector for chaining, to be ordered separately.
3 APE1 PAD21 self-stripping connector, to be ordered separately.

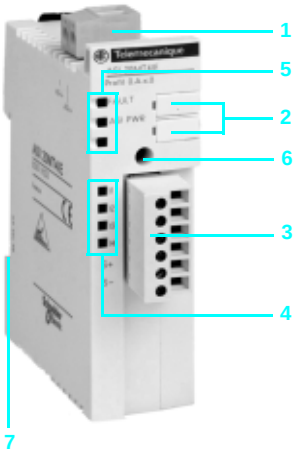
Sensor connection:

4 ASI 20MACC2 screw terminal block, fitted as standard.
5 ASI 20MACC3 spring terminal connector, to be ordered separately.

Chaining



The AS-Interface line can be chained using an ASI 20MACC1 insulation displacement connector, to be ordered separately.



109461-28-M

Description

1 Removable screw terminal block for connection of the AS-Interface line. This terminal block can be replaced by an APE 1PAD21 self-stripping block for connecting a single interface, or by an ASI 20MACC1 quick connect block for chaining several ASI 20MA interfaces.
2 Removable labels for marking the interface and the address, fitted as standard.
3 Removable screw terminal block for connection of the inputs and of the power supply for the sensors. This terminal block can be replaced by an ASI 20MACC3 quick connect terminal block.
4 Not used.
5 Diagnostic LED.
6 “Jack” connector for connection of an ASI TERACC2 cable (see page 5/5) for addressing and diagnostic terminal type ASI TERV2 or XZ MC11.
7 Fitting for clipping onto 35 mm symmetrical DIN rail and screw fixing onto panel.

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Modular, for analogue inputs

Environment

Product certifications			UL, CSA, GL (pending)
Operating temperature		**°C**	- 20…+ 60
Storage temperature		**°C**	- 40…+ 85
Degree of protection	Conforming to IEC/EN 60529		IP 20
Shock resistance	Conforming to IEC/EN 60068-2-27		15 gn (for 11 ms)
Vibration resistance		**Hz**	2…13.2 amplitude ± 1 mm, 13.2…100: 1 gn
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2		Level 3
Resistance to radiated fields	Conforming to IEC/EN 61000-4-3	**V/m**	10
Resistance to transients	Conforming to IEC/EN 61000-4-4	**kV**	2
Overvoltage category	Conforming to IEC/EN 60664-1		II
Degree of pollution	Conforming to IEC/EN 60664-1		2

AS-Interface characteristics

AS-Interface version			V2.1
AS-Interface profile (I/O code, ID code, ID1, ID2) *(1)*			S7.3.F.D
Maximum number of addresses			31
AS-Interface supply		⎓ **V**	26.5…31.6
Consumption on the AS-Interface line	No-load	**mA**	60
	Maximum	**mA**	250
Diagnostic signalling	AS-Interface power ON		Green LED
	Fault *(2)*		Red LED and fault bit
Parameter bit	P0		Not used
	P1		0: input 1 On, input 2 Off, 1: input 1 On, input 2 On
	P2		1: fault bit On
	P3		Not used
Mounting			On 35 mm ⊓⊔ rail (horizontal only) or screw fixing using 2 x Ø 3 screws
Housing material			Polycarbonate (UL94VO)
Connection	AS-Interface		Removable terminal block ASI 20MACC4: 0.2 to 2.5 mm²; ASI 20MACC1: 0.5 to 0.75 mm²; APE 1PAD2: 0.5 to 0.75 mm²
	Sensors		Removable terminal block ASI 20MACC2: max 1.5 mm²; ASI 20MACC3: 0.14 to 1.5 mm²

Analogue input characteristics (sensor side)

Interface type			**ASI 20MA2VU**	**ASI 20MA2VI**
Inputs	Voltage	⎓ **V**	0…10	–
	Current	⎓ **mA**	–	0…20 or 4…20
Sensor input type			Analogue	
Max. permissible value without destruction *(3)*		⎓ **V**	14	–
		⎓ **mA**	–	24
Supply to sensors		**V**	Via the AS-Interface line only	
Input impedance		Ω	20 000	250
Range of values		**decimal**	0…10 000	0…20 000 or 4000…20 000
Resolution		**bits**	12	
Refresh time		**ms**	< 50	

(1) Bit ID1 can be modified by the user, in particular using the addressing terminal.
(2) Fault LED:
off = if parameter bit 2 On, no fault,
on steady = AS-Interface exchange fault,
flashing = voltage > 10.5 V (VU), current < 1 mA or > 21 mA (VI).
(3) The inputs are not protected above these values.

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Modular, for analogue inputs

1

ASI 20MA2V●

References

Modular interfaces supplied with removable screw terminal blocks

Inputs *(1)*			Reference	Weight kg
Number		**Type**		
2		⎓ 0…10 V	**ASI 20MA2VU**	0.090
		⎓ 0…20 mA ⎓ 4…20 mA	**ASI 20MA2VI**	0.090

Spare parts

Description	For use with	Terminal block type	Sold in lots of	Unit reference	Weight kg
Connectors	AS-Interface	Screw	5 yellow + 5 black	**ASI 20MACC4**	0.010
		Insulation Displacement Connector	5 yellow + 5 black	**ASI 20MACC1**	0.010
		Self-stripping connector	16 grey	**APE 1PAD21**	0.003
	Inputs *(2)*	Screw	10	**ASI 20MACC2**	0.020
		Spring	10	**ASI 20MACC3**	0.020
Labels	–	–	22	**ASI 20MACC5**	–

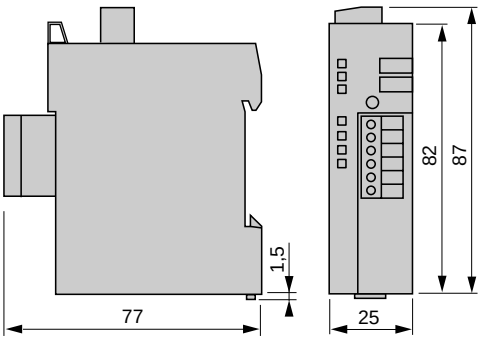
(1) The inputs and sensor electronics are supplied from the AS-Interface line.
(2) Connectors supplied with locating facility not activated; locating facility to be activated by cutting off a lug.

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Modular, for analogue inputs

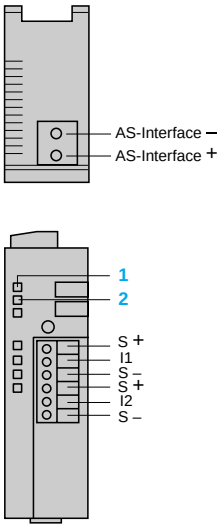
Dimensions

ASI 20MA2V●



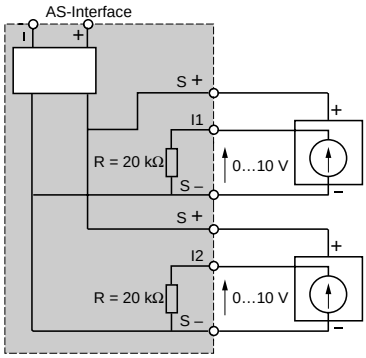
Connections

ASI 20MA2V●



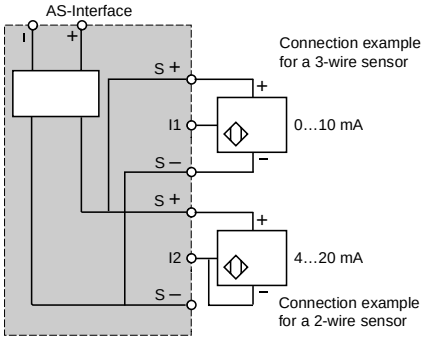
1 red "FAULT" LED
2 green "ASI PWR" LED

ASI 20MA2VU



⚠ The sensors do not have to be supplied from an external source.
The inputs are not protected against overvoltage.

ASI 20MA2VI



⚠ The sensors do not have to be supplied from an external source.
The inputs are not protected against overcurrent.

LED signalling

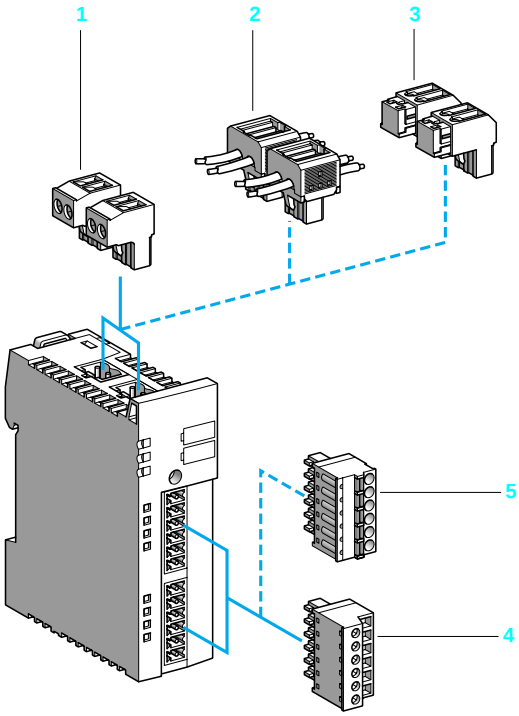
LED	ASI PWR	FAULT
Normal operation	☀	□
AS-Interface exchange fault	☀	☀
ASI 20MA2VU input overload: U > 10.5 V ASI 20MA2VI input overload or underload: I < 1 mA or I > 21 mA	☀	☀ (1)

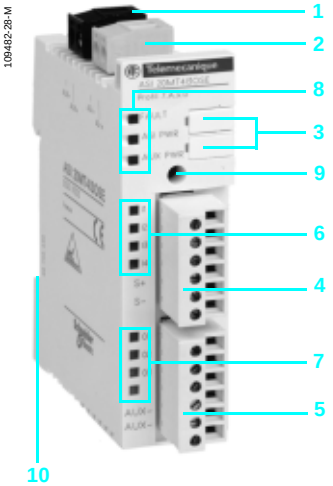
(1) Flashing.

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Modular, for discrete inputs/outputs

1





109482-29-M

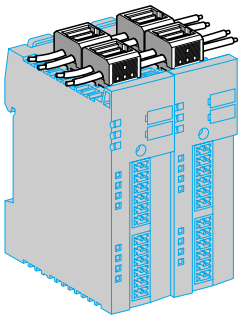
Presentation

ASI 20MT modular interfaces enable traditional discrete sensors and actuators (sensors, motor starters, pushbuttons, pilot lights...) to be connected to the AS-Interface cabling system.
Due to their particularly compact size, they are suitable for fitting in small-size enclosures (pushbutton and pilot light interfacing) as well as in larger, floor-standing enclosures.
Conforming to the AS-Interface V2.1 specification, they offer diagnostic functions and are available, depending on the model, with standard addressing (up to 31 Slaves per Master) or with extended A/B addressing (up to 62 Slaves per Master).
The inputs are compatible with 2 and 3-wire sensors, supply to the the sensors being provided, depending on the model, via the AS-Interface line or by an external ⎓ 24 V source (isolated inputs).
The outputs, supplied by an external source, are of the relay or 2 A triac or 0.5 A transistor type.
All connectors are of the removable type and are supplied with screw terminal block as standard. Quick connect terminal blocks are available as an accessory. A "Jack" connector on the front panel allows allows addressing of the product independently, or when installed.

Composition

AS-Interface and auxiliary supply connection:
1 ASI 20MACC4 screw terminal blocks, fitted as standard.
2 ASI 20MACC1 insulation displacement connectors for chaining, to be ordered separately.
3 APE 1PAD21 self-stripping connectors, to be ordered separately.
Sensor/actuator connection:
4 ASI 20MACC2 screw terminal blocks, fitted as standard.
5 ASI 20MACC3 spring terminal connectors, to be ordered separately.

Chaining



The AS-Interface line and the auxiliary supply can be chained using ASI 20MACC1 insulation displacement connectors, to be ordered separately.

Description

1 Removable screw terminal block for connection of a ⎓ 24 V PELV (Protective Extra Low Voltage) auxiliary power supply, for supply to the transistor outputs and the isolated inputs. This terminal block can be replaced by an APE 1PAD21 self-stripping block or an ASI 20MACC1 quick connect block for chaining several ASI 20MT interfaces.
2 Removable screw terminal block for connection of the AS-Interface line. This terminal block can be replaced by an APE 1PAD21 self-stripping block or an ASI 20MACC1 quick connect block for chaining several ASI 20MT interfaces.
3 Removable labels for marking the interface and the address, fitted as standard.
4 Removable screw terminal block for connection of the inputs and of the power supply for the sensors. This terminal block can be replaced by an ASI M20ACC3 quick connect terminal block. This terminal block is fitted with a locating facility to prevent inversion of the 2 terminal blocks on the front panel.
5 ASI 20MACC2 removable screw terminal block for connection of the outputs and of the power supply for the relay and triac outputs. This terminal block can be replaced by an ASI 20MACC3 quick connect terminal block.
6 Input status LED.
7 Output status LED.
8 Diagnostic LED.
9 “Jack” connector for connection of an ASI TERACC2 cable (see page 5/5) for addressing and diagnostic terminal type ASI TERV2 or XZ MC11.
10 Device for clipping onto 35 mm symmetrical DIN rail and screw fixing onto panel.

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Modular, for discrete inputs/outputs

Environment

Product certifications			UL, CSA, GL (pending)
Operating temperature		**°C**	- 20…+ 60
Storage temperature		**°C**	- 40…+ 85
Degree of protection	Conforming to IEC/EN 60529		IP 20
Shock resistance	Conforming to IEC/EN 60068-2-27		15 gn (for 11 ms)
Vibration resistance		**Hz**	2…13.2 amplitude ± 1 mm, 13.2…100: 1 gn
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2	**kV**	6
Resistance to radiated fields	Conforming to IEC/EN 61000-4-3	**V/m**	10
Resistance to transients	Conforming to IEC/EN 61000-4-4	**kV**	2
Dielectric test voltage between AS-Interface line and the outputs	Conforming to IEC/EN 60364-4-41	**V**	500 (transistor outputs), 3750 (relay and triac outputs)
Overvoltage category	Conforming to IEC/EN 60664-1		II
Degree of pollution	Conforming to IEC/EN 60664-1		2

AS-Interface characteristics

AS-Interface version				V2.1
AS-Interface supply			⎓ **V**	26.5…31.6
Diagnostic signalling	AS-Interface power ON			Green LED
	Auxiliary supply ON			Green LED
	Input/output status			Yellow LED
	Fault *(1)*			Red LED
N° of data bits/n° of inputs or outputs		D0		Input 1 or output 1
		D1		Input 2 or output 2
		D2		Input 3 or output 3
		D3		Input 4 or output 4
Value of input or output status data bit		D0 to D3		0 = input or output OFF 1 = input or output ON
Output fallback if watchdog tripped				Output state 0
Parameter bit				Not used
Mounting				On 35 mm ⊓ rail (horizontal only) or screw fixing using 2 x Ø 3 screws
Housing material				Polycarbonate (UL94VO)
Connection	AS-Interface			Removable terminal block ASI 20MACC4: 0.2 to 2.5 mm²; ASI 20MACC1: 0.5 to 0.75 mm²; APE 1PAD21: 0.5 to 0.75 mm²
	Sensors			Removable terminal block ASI 20MACC2: max 1.5 mm²; ASI 20MACC3: 0.14 to 1.5 mm²

(1) Fault LED:
off = no fault,
on steady = no data exchange on AS-Interface,
flashing = peripheral fault.

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Modular, for discrete inputs/outputs

1

AS-Interface characteristics specific to I/O with standard addressing

Interface type		ASI	20MT4I4OR	20MT4I4OS	20MT4I4OSA
Maximum number of addresses for one master			31		
Number of inputs			4	4	4 isolated *(1)*
Number of outputs			4 x 2 A relay	4 x 0.5 A transistor	
Supply to the sensors (inputs)			Via the AS-Interface line max: 200 mA		Via external PELV *(2)* power supply (AUX) max: 200 mA
Supply to the actuators (outputs)			External ∿ 250 V max, ⎓ 150 V max	Via external PELV *(2)* power supply (AUX)	
Profile (I/O code, ID code, ID1, ID2) *(3)*			S7.0.F.E		
AS-Interface certifications			N° 52101	N° 52301	N° 52401
Consumption on the AS-Interface line	No-load	**mA**	15	15	15
	Maximum *(4)*	**mA**	110	50	20

AS-Interface characteristics specific to I/O with extended A/B addressing

Interface type		ASI	20MT4IE	20MT2I1OTE	20MT4I3ORE	20MT4I3OSE	20MT4I3OSAE
Maximum number of addresses for one master			62				
Number of inputs			4	2	4	4	4 isolated *(1)*
Number of outputs			–	1 x 2 A triac	3 x 2 A relay	3 x 0.5 A transistor	
Supply to the sensors (inputs)			Via the AS-Interface line max: 170 mA		Via the AS-Interface line max: 170 mA	Via the AS-Interface line max: 150 mA	Via external PELV *(2)* power supply (AUX) max: 200 mA
Supply to the actuators (outputs)			–	External ∿ 24…250 V	External max: ∿ 250 V	Via external PELV *(2)* power supply (AUX)	
Profile (I/O code, ID code, ID1, ID2) *(3)*			S0.A.7.0	S3.A.7.0	S7.A.7.0		
AS-Interface certification n°			52501	53801	52201	52302	52401
Consumption on the AS-Interface line	No-load	**mA**	15	15	15	15	15
	Maximum *(4)*	**mA**	50	40	90	50	20

Input characteristics (sensor side)

Interface type		ASI	20MT4IE	20MT4I4OR 20MT4I3ORE	20MT4I4OSA 20MT4I3OSAE	20MT4I4OS 20MT4I3OSE	20MT2I1OTE
Sensor type			PNP 2 or 3-wire				
State 1 guaranteed			U > 11 V and I > 6 mA				
State 0 guaranteed			U < 5 V and I < 2 mA				
Conformity of inputs	Conforming to IEC 61131-2		Type 2				

Output characteristics (sensor side)

Interface type			ASI	20MT4IE	20MT4I4OR 20MT4I3ORE	20MT4I4OSA 20MT4I3OSAE	20MT4I4OS 20MT4I3OSE	20MT2I1OTE
Rated operational voltage (Ue)	Conforming to IEC 60947-5-1	∿	**V**	–	250	–	–	250
		⎓	**V**	–	150	19.2...30 PELV *(2)*	19.2...30 PELV *(2)*	–
Maximum drop-out voltage at Ith			**V**	–	–	0.3	0.3	3
Thermal current per channel (Ith/channel)			**A**	–	2	0.5	0.5	2
Thermal current per common			**A**	–	4	2	2	2
Rated operational current (Ie) Conforming to IEC 60947-5-1 6 cycles/minute 24…250 V∿ 24…150 V⎓	AC 12		**A**	–	2	–	–	2
	DC 12		**A**	–	0.5	0.5	0.5	–
	AC 15		**A**	–	0.5	–	–	–
	DC 13		**A**	–	0.25	0.5	0.5	–
	AC 14		**A**	–	0.5	–	–	–
Minimum current			**mA**	–	10	0.5	0.5	8
Maximum leakage current			**mA**	–		0.5 at ⎓ 30 V		–
Built-in overcurrent protection			**A**	–	No	Yes, electronic		No
Mechanical life in millions of operating cycles				–	20	–	–	–
Response time *(5)*	Switching time from OFF to ON		**ms**	1	10	1	1	10
	Switching time from ON to OFF		**ms**	1	10	1	1	10

(1) AS-Interface line isolated inputs. These inputs have a potential common with the outputs.
(2) Protective Extra Low Voltage ⎓ 19.2…30 V; the regulations relating to these installations are defined in publication NF C 12-201 and in standard IEC 60364-4-41.
(3) Bit ID1 can be modified by the user, in particular using the addressing terminal.
(4) Consumption with all Inputs/Outputs On and sensor not energised.
(5) Add the AS-Interface cycle time.

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Modular, for discrete inputs/outputs

References

ASI 20MT4I4OR

ASI 20MT4IE

ASI 20MT4I3OSE

Modular interfaces supplied with removable screw terminal blocks

Type of addressing	Number of inputs *(1)*	Number, type of outputs	Reference	Weight kg
Standard	4	4 x ≂ 250 V/2 A relay	**ASI 20MT4I4OR**	0.090
		4 x ⎓ 24 V/0.5 A transistor	**ASI 20MT4I4OS**	0.090
	4 isolated	4 x ⎓ 24 V/0.5 A transistor	**ASI 20MT4I4OSA**	0.090
Extended A/B	4	–	**ASI 20MT4IE**	0.090
	2	1 x ∿ 250 V/2 A triac	**ASI 20MT2I1OTE**	0.090
	4	3 x ≂ 250 V/2 A relay	**ASI 20MT4I3ORE**	0.090
		3 x ⎓ 24 V/0.5 A transistor	**ASI 20MT4I3OSE**	0.090
	4 isolated	3 x ⎓ 24 V/0.5 A transistor	**ASI 20MT4I3OSAE**	0.090

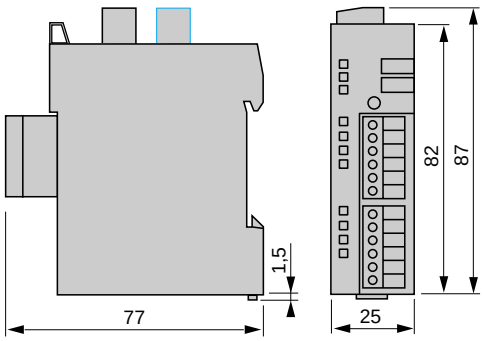
Spare parts

Description	For use with	Terminal block type	Sold in lots of	Unit reference	Weight kg
Connectors	AS-Interface and auxiliary	Screw	5 yellow + 5 black	**ASI 20MACC4**	0.010
		Insulation Displacement Connector	5 yellow + 5 black	**ASI 20MACC1**	0.010
		Self-stripping connector	16 grey	**APE 1PAD21**	0.240
	Inputs/outputs *(2)*	Screw	10	**ASI 20MACC2**	0.020
		Spring	10	**ASI 20MACC3**	0.020
Legends	–	–	22	**ASI 20MACC5**	–

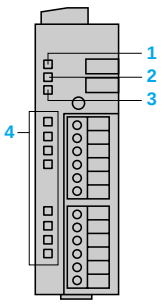
(1) Unless marked "isolated", the inputs and sensor electronics are supplied from the AS-Interface line.
(2) Connectors supplied with locating facility not activated; locating facility to be activated by cutting off a lug.

Dimensions

ASI 20MT●●●



LED signalling



1 *red "FAULT" LED*
2 *green "ASI PWR" LED*
3 *green "AUX PWR" LED*
4 *yellow LEDs: inputs/outputs*

LED	ASI PWR	AUX PWR	FAULT
Normal operation	☀	☀	□
Output short-circuited	☀	☀	▮ *(1)*
No auxiliary supply	☀	□	▮ *(1)*
AS-Interface exchange fault	☀	☀	☀

LED	Inputs/outputs
ON	☀
OFF	□

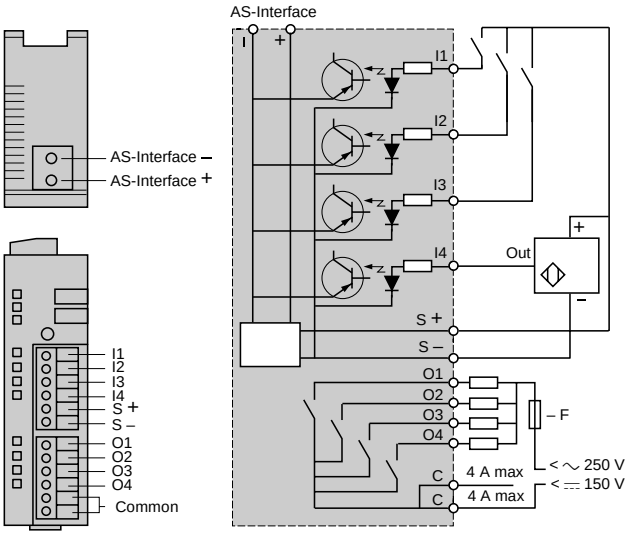
(1) Flashing.

AS-Interface cabling system

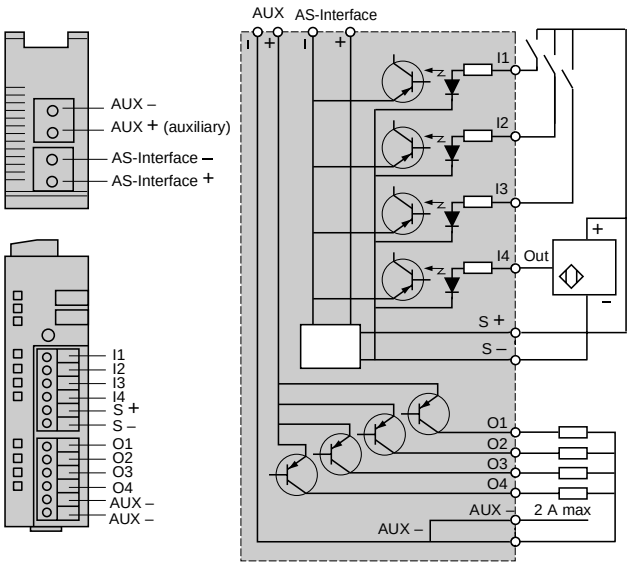
Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Modular, for discrete inputs/outputs

1

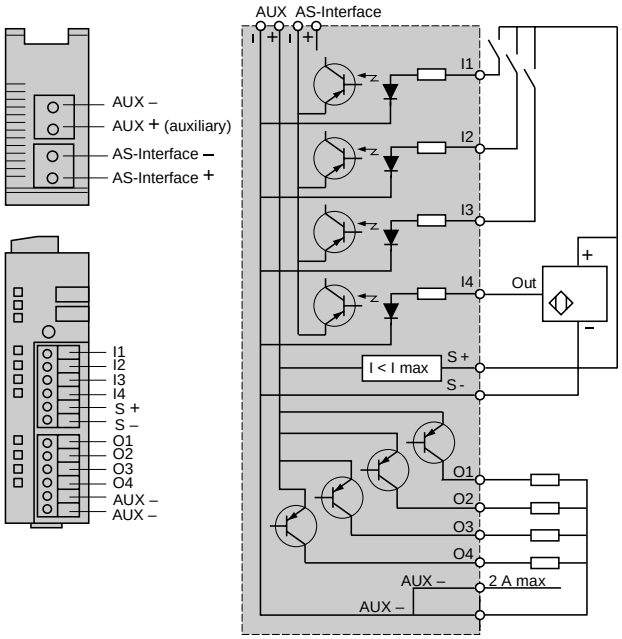
ASI 20MT4I4OR



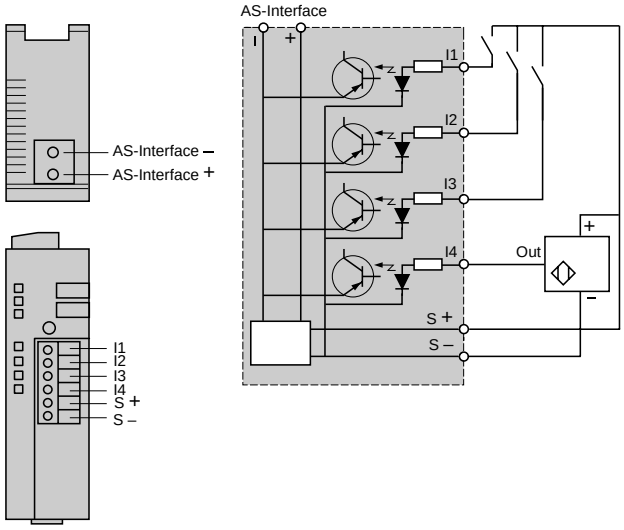
ASI 20MT4I4OS



ASI 20MT4I4OSA



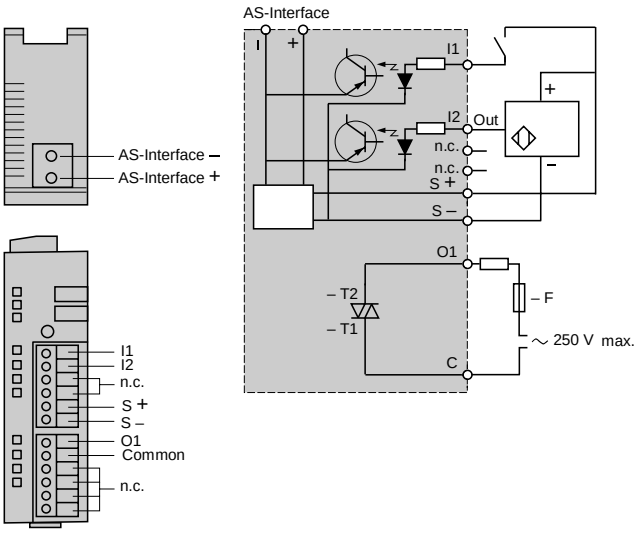
ASI 20MT4IE



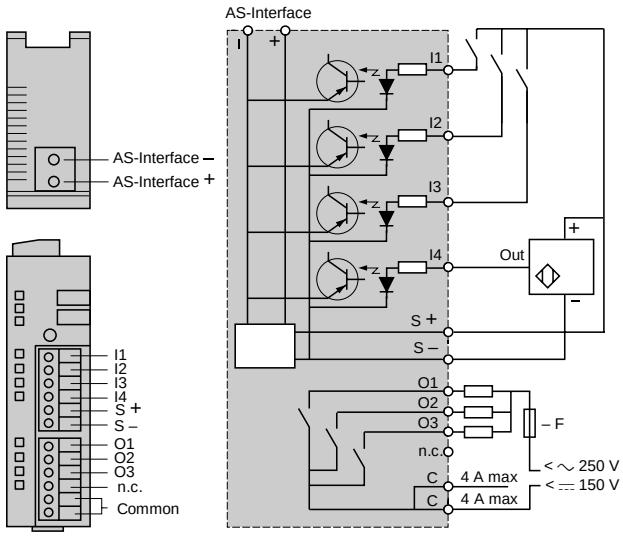
AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Modular, for discrete inputs/outputs

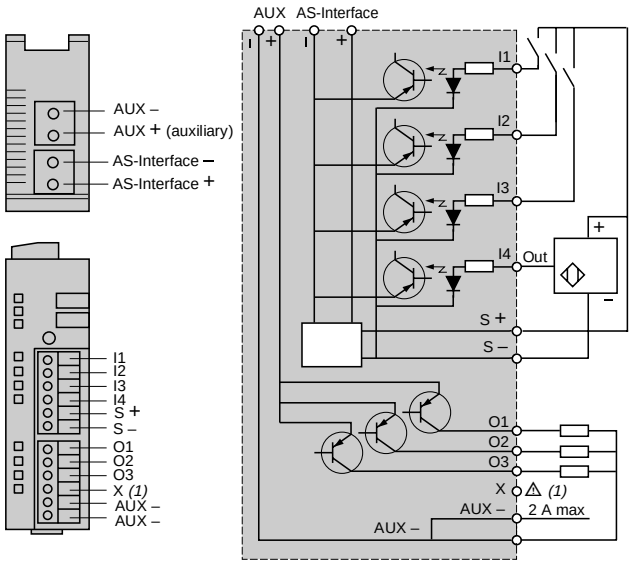
ASI 20MT2I1OTE



ASI 20MT4I3ORE

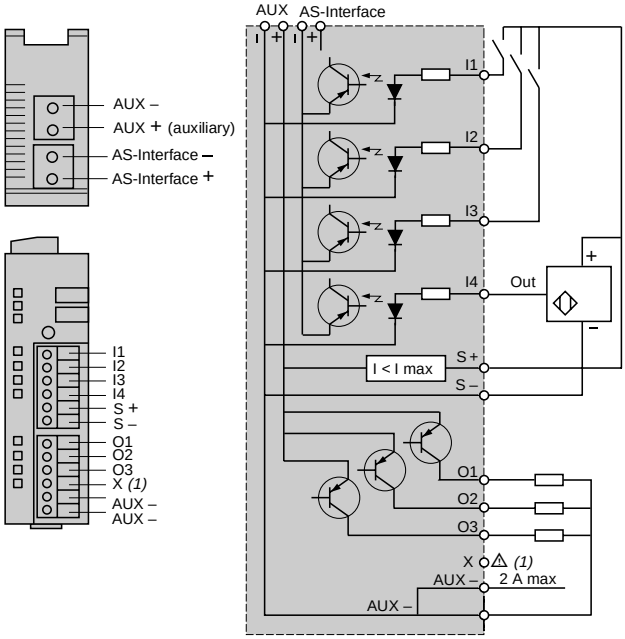


ASI 20MT4I3OSE



(1) Do not connect anything to this terminal.

ASI 20MT4I3OSAE



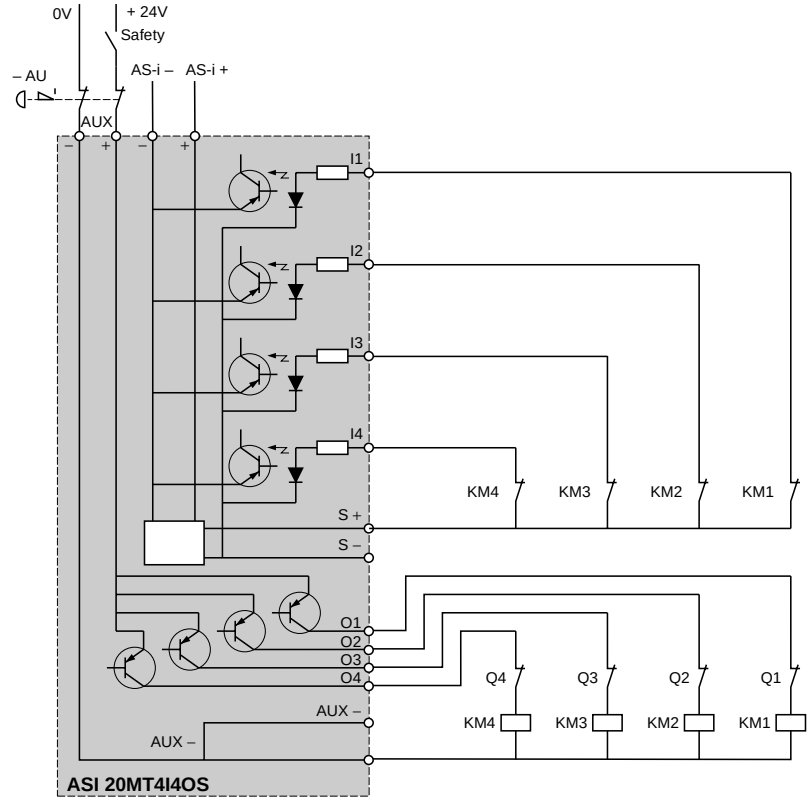
(1) Do not connect anything to this terminal.

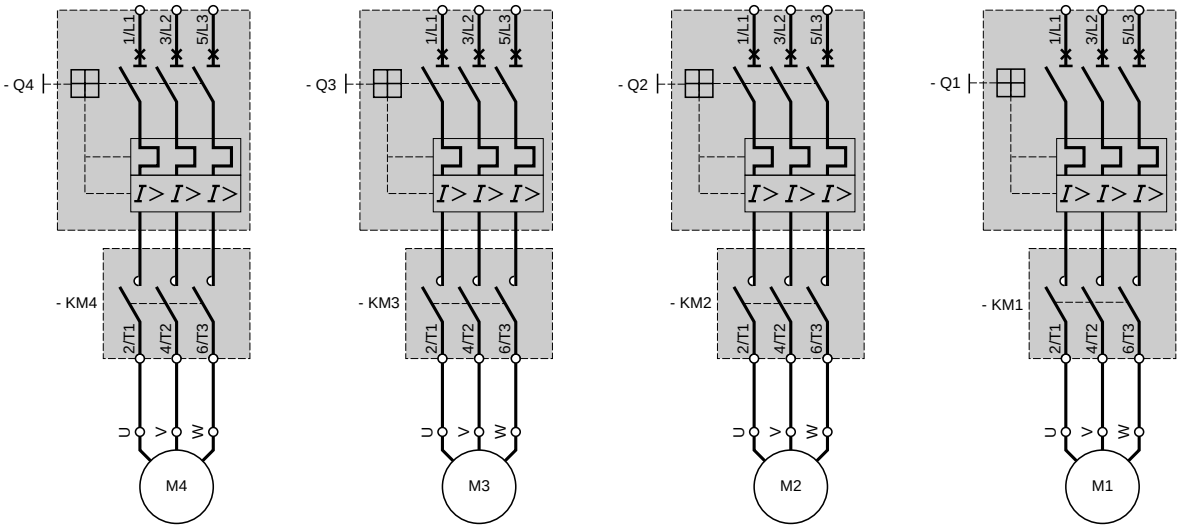
AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Connection of motor starters

1

Recommended schemes: control of non-reversing motors





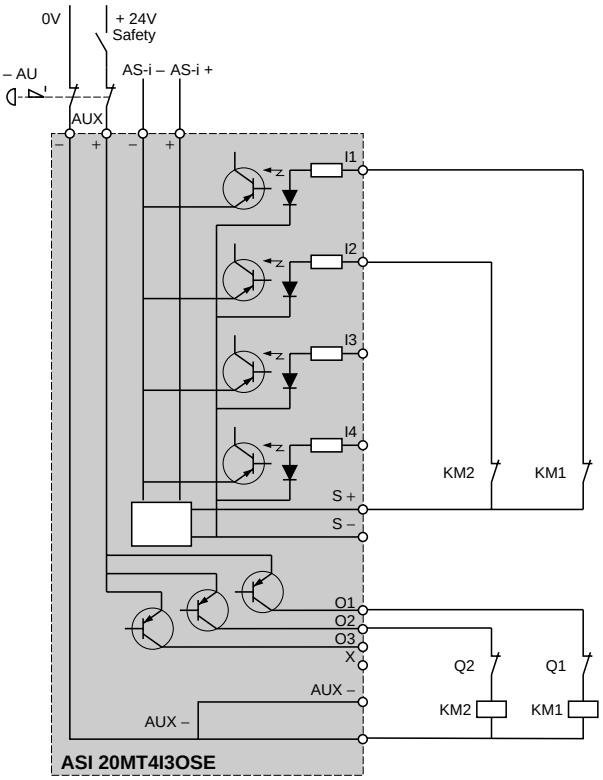
Data exchange characteristics

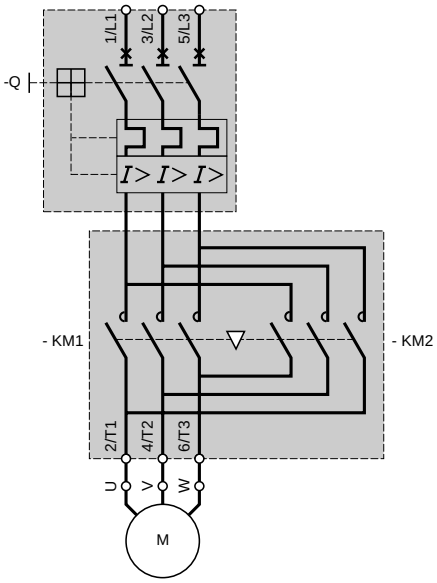
AS-Interface profile	S.7.0.F.E		
Data bits (commands)	Bit value	= 0	= 1
	Commands D0 (O)	De-energise contactor 1	Energise contactor 1
	Commands D1 (O)	De-energise contactor 2	Energise contactor 2
	Commands D2 (O)	De-energise contactor 3	Energise contactor 3
	Commands D3 (O)	De-energise contactor 4	Energise contactor 4
Data bits (status)	Bit value	= 0	= 1
	Status D0 (I)	Contactor 1 energised	Contactor 1 de-energised
	Status D1 (I)	Contactor 2 energised	Contactor 2 de-energised
	Status D2 (I)	Contactor 3 energised	Contactor 3 de-energised
	Status D3 (I)	Contactor 4 energised	Contactor 4 de-energised

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Connection of motor starters

Recommended schemes: control of reversing motors





Data exchange characteristics

AS-Interface profile	S.7.A.7.0		
Data bits (commands)	Bit value	= 0	= 1
	Commands D0 (O)	Stop forward running	Start forward running
	Commands D1 (O)	Stop reverse running	Start reverse running
	Commands D2 (O)	Not used	
	Commands D3 (O)	Do not use	
Data bits (status)	Bit value	= 0	= 1
	Status D0 (I)	Forward running	Stopped forward running
	Status D1 (I)	Reverse running	Stopped reverse running
	Status D2 (I)	Not used	
	Status D3 (I)	Not used	

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Connection of motor starters

1

Standard motor starters

Rated operational power for utilisation category AC-3		D.O.L. starters, non-reversing			Reversing starters				Contactor consumption at 24 V
400/415 V	220/230 V	Circuit-breakers Q1 to Q4	Add-on auxiliary block	Contactors KM1 to KM4	Circuit-breaker Q	Add-on auxiliary block	Reversing starters KM1 and KM2	Add-on auxiliary block	
		Reference	Reference	Reference	Reference	Reference	Reference	Reference	
kW	kW								mA
0.06	–	**GV2 ME02**	**GV AE20**	**LP1 K0601BD**	**GV2 ME02**	**GV AE20**	**LP2 K0601BD**	**LA1 KN11**	125
0.09	0.06	**GV2 ME03**	**GV AE20**	**LP1 K0601BD**	**GV2 ME03**	**GV AE20**	**LP2 K0601BD**	**LA1 KN11**	125
0.12/0.18	–	**GV2 ME04**	**GV AE20**	**LP1 K0601BD**	**GV2 ME04**	**GV AE20**	**LP2 K0601BD**	**LA1 KN11**	125
0.25	0.09/0.12	**GV2 ME05**	**GV AE20**	**LP1 K0601BD**	**GV2 ME05**	**GV AE20**	**LP2 K0601BD**	**LA1 KN11**	125
0.37/0.55	0.18/0.25	**GV2 ME06**	**GV AE20**	**LP1 K0601BD**	**GV2 ME06**	**GV AE20**	**LP2 K0601BD**	**LA1 KN11**	125
0.75	0.37	**GV2 ME07**	**GV AE20**	**LP1 K0601BD**	**GV2 ME07**	**GV AE20**	**LP2 K0601BD**	**LA1 KN11**	125
1.1/1.5	0.55/0.75	**GV2 ME08**	**GV AE20**	**LP1 K0601BD**	**GV2 ME08**	**GV AE20**	**LP2 K0601BD**	**LA1 KN11**	125
2.2	1.1	**GV2 ME10**	**GV AE20**	**LP1 K0601BD**	**GV2 ME10**	**GV AE20**	**LP2 K0601BD**	**LA1 KN11**	125
3/4	1.5	**GV2 ME14**	**GV AE20**	**LP1 K0901BD**	**GV2 ME14**	**GV AE20**	**LP2 K0901BD**	**LA1 KN11**	125
5.5	2.2/3	**GV2 ME16**	**GV AE20**	**LC1 D12BD**	**GV2 ME16**	**GV AE20**	**LC2 D12BD**	**LAD N11**	125
7.5	4	**GV2 ME20**	**GV AE20**	**LC1 D18BD**	**GV2 ME20**	**GV AE20**	**LC2 D18BD**	**LAD N11**	225
9	–	**GV2 ME21**	**GV AE20**	**LC1 D25BD**	**GV2 ME21**	**GV AE20**	**LC2 D25BD**	**LAD N11**	225
11	5.5	**GV2 ME22**	**GV AE20**	**LC1 D25BD**	**GV2 ME22**	**GV AE20**	**LC2 D25BD**	**LAD N11**	225
15	7.5/9	**GV2 ME32**	**GV AE20**	**LC1 D32BD**	**GV3 ME40**	**GV3 A03**	**LC2 D32BD**	**LAD N11**	225
18.5	–	**GV3 ME40**	**GV3 A02**	**LC1 D32BD**	**GV3 ME40**	**GV3 A03**	**LC2 D32BD**	**LAD N11**	225
22	11	**GV3 ME63**	**GV3 A02**	**LC1 D50BD**	–	–	–	–	920 *(1)*
30	15	**GV3 ME63**	**GV3 A02**	**LC1 D65BD**	–	–	–	–	920 *(1)*
37	18.5/22	**GV7 RE80**	**GV7 AE11**	**LC1 D80BD**	–	–	–	–	920 *(1)*

(1) For these motor starters, use interfaces with relay outputs ASI 20MT4I4OR or ASI 20MT4I3ORE.

AS-Interface cabling system

Advantys, interfaces for generic products
IP 20, AS-Interface V2.1
Connection of motor starters

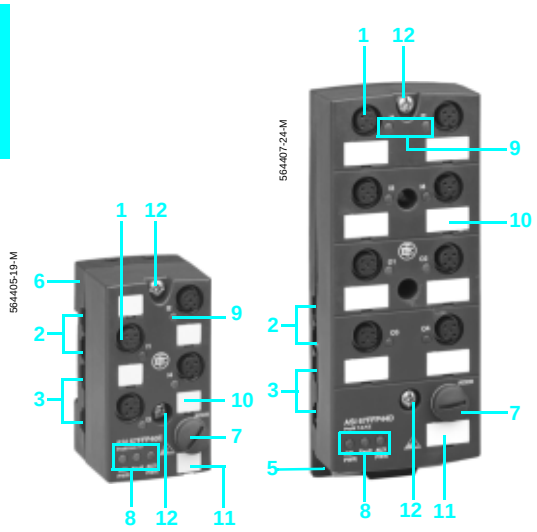
High performance motor starters

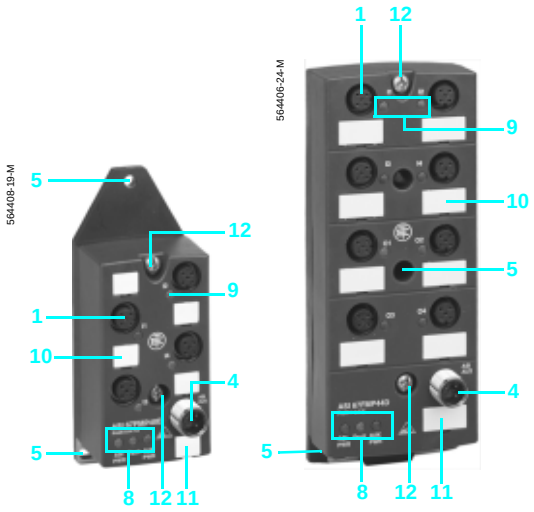
Rated operational power for utilisation category AC-3		D.O.L. starters, non-reversing			Reversing starters				Consumption contactor at 24 V
400/415 V	220/230 V	Circuit-breakers Q1 to Q4	Add-on auxiliary block	Contactors KM1 to KM4	Circuit-breaker Q	Add-on auxiliary block	Reversing starters KM1 and KM2	Add-on auxiliary block	
		Reference	Reference	Reference	Reference	Reference	Reference	Reference	
kW	kW								mA
0.06	–	**GV2 P02**	**GV AE20**	**LC1 D09BD**	**GV2 P02**	**GV AE20**	**LC2 D09BD**	**LAD N11**	225
0.09	0.06	**GV2 P03**	**GV AE20**	**LC1 D09BD**	**GV2 P03**	**GV AE20**	**LC2 D09BD**	**LAD N11**	225
0.12/0.18	–	**GV2 P04**	**GV AE20**	**LC1 D09BD**	**GV2 P04**	**GV AE20**	**LC2 D09BD**	**LAD N11**	225
0.25	0.09/0.12	**GV2 P05**	**GV AE20**	**LC1 D09BD**	**GV2 P05**	**GV AE20**	**LC2 D09BD**	**LAD N11**	225
0.37/0.55	0.18/0.25	**GV2 P06**	**GV AE20**	**LC1 D09BD**	**GV2 P06**	**GV AE20**	**LC2 D09BD**	**LAD N11**	225
0.75	0.37	**GV2 P07**	**GV AE20**	**LC1 D09BD**	**GV2 P07**	**GV AE20**	**LC2 D09BD**	**LAD N11**	225
1.1/1.5	0.55/0.75	**GV2 P08**	**GV AE20**	**LC1 D18BD**	**GV2 P08**	**GV AE20**	**LC2 D18BD**	**LAD N11**	225
2.2	1.1	**GV2 P10**	**GV AE20**	**LC1 D18BD**	**GV2 P10**	**GV AE20**	**LC2 D18BD**	**LAD N11**	225
3/4	1.5	**GV2 P14**	**GV AE20**	**LC1 D18BD**	**GV2 P14**	**GV AE20**	**LC2 D18BD**	**LAD N11**	225
5.5	2.2/3	**GV2 P16**	**GV AE20**	**LC1 D25BD**	**GV2 P16**	**GV AE20**	**LC2 D25BD**	**LAD N11**	225
7.5	4	**GV2 P20**	**GV AE20**	**LC1 D25BD**	**GV2 P20**	**GV AE20**	**LC2 D25BD**	**LAD N11**	225
9	–	**GV2 P21**	**GV AE20**	**LC1 D25BD**	**GV2 P21**	**GV AE20**	**LC2 D25BD**	**LAD N11**	225
11	5.5	**GV2 P22**	**GV AE20**	**LC1 D25BD**	**GV2 P22**	**GV AE20**	**LC2 D25BD**	**LAD N11**	225
15	7.5/9	**GV3 ME40**	**GV3 A02**	**LC1 D80BD**	**GV3 ME40**	**GV3 A02**	–	–	920 *(1)*
18.5	–	**GV3 ME40**	**GV3 A02**	**LC1 D80BD**	**GV3 ME40**	**GV3 A02**	–	–	920 *(1)*
22	11	**GV3 ME63**	**GV3 A02**	**LC1 D80BD**	–	–	–	–	920 *(1)*
30	15	**GV3 ME63**	**GV3 A02**	**LC1 D80BD**	–	–	–	–	920 *(1)*
37	18.5/22	**GV7 RE80**	**GV7 AE11**	**LC1 D80BD**	–	–	–	–	920 *(1)*

(1) For these motor starters, use interfaces with relay outputs ASI 20MT4I40R or AS 20MT4I30RE.

AS-Interface cabling system

Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1





Presentation

ASI 67F interfaces enable traditional sensors and actuators - in particular proximity sensors, photo-electric sensors and limit switches - to be connected to the AS-Interface cabling system.

Because of their IP 67 degree of protection, they can be mounted directly on the machine, as near as possible to the sensors and actuators.

Two types of housing are available:
- A compact, 45 mm wide housing for 4-channel interfaces.
- A flat, 60 mm wide housing for 8-channel interfaces.

The sensors and actuators are connected to the interface by M12 connectors. The AS-Interface line and any external power supply are connected in one of the following ways, depending on the model:
- Directly to the ribbon cables via an Insulation Displacement Connector (IDC) (2 possible mounting positions).
- By means of an M12 connector.

Conforming to the AS-Interface V2.1 specification, they offer diagnostic functions and are available, depending on the model, with standard addressing (up to 31 Slaves per master) or with extended addressing (up to 62 Slaves per master).

Specific "V1 compatible" versions allow replacement of previous XZS interfaces and use in association with V1 masters.

The inputs are compatible with 2 and 3-wire sensors and with the majority of models in the Osiris, Osiprox and Osiswitch sensor ranges, with or without alarm output.
Supply to the sensors (200 mA max) is via the AS-Interface line.
The outputs, supplied by an external source, are of the 2 A transistor type.

Description

ASI 67F interfaces comprise:
1 M12 connectors for connecting the sensors and actuators.
2 Connector for yellow ribbon cable (AS-Interface line).
3 Connector for black ribbon cable (auxiliary supply) - depending on model.
4 M12 connectors for connecting the AS-Interface line and the auxiliary power supply, also allowing connection for addressing via an ASI TERACC1F connection cable.
5 Holes for fixing screws.
6 Fitting for clipping onto 35 mm symmetrical rail.
7 Jack connector for connection of an ASI TERACC2 cable for terminal ASI TERV2 or XZ MC11.
8 Diagnostic LED.
9 I/O status LED.
10 Channel marker labels.
11 Interface marker label.
12 Interface to connection base fixing screws.

Setting-up : pages 1/19 and 1/20
Characteristics : pages 1/21 and 1/22
References : pages 1/23 to 1/25
Dimensions : page 1/26
Schemes, connections : pages 1/27 to 1/30

AS-Interface cabling system
Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1

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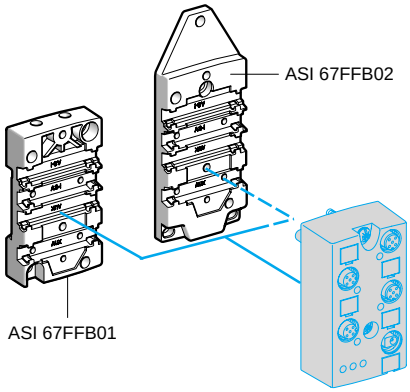

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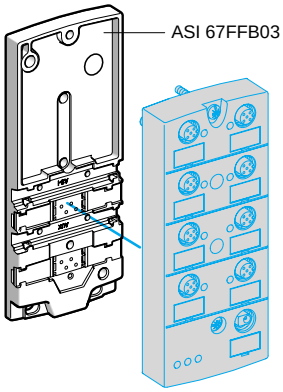

Conventional direction

Reversed direction

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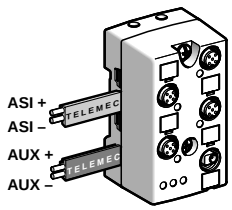

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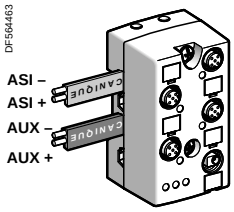

Example of connection to 4-channel module

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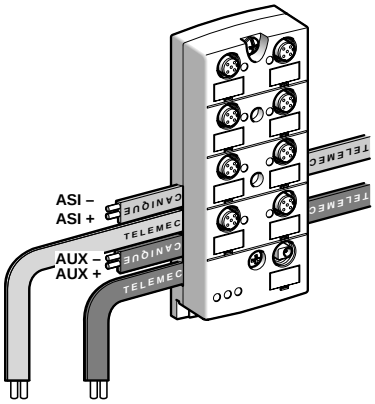


Tap-offs

Example of tap-offs on 8-channel module

Setting-up of direct connection modules
(Insulation Displacement Connector)

This method of connecting the AS-Interface lines and the auxiliary power supply enables fast and simple installation, without any connection accessories, while limiting the length of the AS-Interface cable.

Direct connection modules consist of an interface and a connection base.

45 mm wide compact type interfaces (4-channel) can be used with 2 connection base models:

■ An ASI 67FFB01 compact connection base, whose fixing centres are identical to those of the V1 type XZSD interface ranges. This connection base can also be mounted on a 35 mm symmetrical rail.

■ An ASI67FFB02 connection base, whose fixing centres are identical to those of ASI B4VM12 connection bases and conform to the CNOMO standard.

60 mm wide flat type interfaces (8-channel) must be used with an ASI 67FFB03 connection base. The fixing centres are identical to those of the V1, XZS CA type interface ranges and of ASI B8VM12 connection bases. These fixing centres conform to the CNOMO standard.

For all models (4 and 8-channel), connections to the yellow (AS-Interface) and black (auxiliary supply) ribbon cables are made via the IDC connectors on the interface. The ribbon cables can be fitted either way round and 2 yellow cables and 2 black cables can be connected simultaneously to one interface, to constitute a tap-off (max. current in the tap-off: 2 A, degree of protection IP 54).

Any unused M12 connectors **must** be fitted with a sealing plug to guarantee the IP 67 degree of protection. The sealing plugs supplied with the interfaces and additional components can also be ordered separately.

Interface addressing can be carried out, before or after installation, using ASI TERV2 or XZM C11 terminals equipped with an ASI TERACC2 cable and connected to the Jack connector.

1

Setting-up of remote connection modules (M12 type)

This connection method allows fast disconnection of the interfaces. It is particularly suitable for "star" wiring and requires the use of tap-offs for ribbon cable. It is advisable to reduce the length of these tap-offs to the minimum necessary.

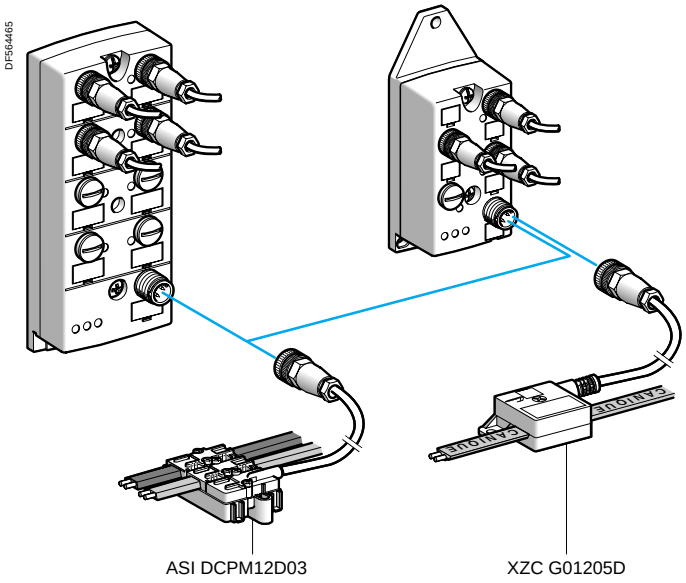
These modules are of the monobloc type; there is no need to order a separate connection base.

Fixing centres are identical to those of the ASI 67FFB03 connection base.

Any unused M12 connectors **must** be fitted with a sealing plug to guarantee the IP 67 degree of protection. The sealing plugs supplied with the interfaces and additional components can also be ordered separately.

Interface addressing can be carried out, before or after installation, using ASI TERV2 or XZM C11 terminals equipped with an ASI TERACC1F cable and connected to the AS-Interface/Aux. M12 connector.

Example showing connection of remote connection modules using tap-offs.



AS-Interface cabling system
Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1

Environment

Product certifications			UL, CSA (GL pending)
Operating temperature	To IEC/EN 60529	**°C**	- 25…+ 70
Storage temperature		**°C**	- 40…+ 85
Installation category	To IEC 60664		II
Degree of protection	To IEC 60529		IP 67 (IP 54 for use as tap-off or at line end)
Shock resistance	To IEC 60068-2-27		30 gn (for 11 ms)
Vibration resistance	To IEC/EN 60068-2-6		2…36 Hz: amplitude 1 mm, 36...150 Hz: 5 gn
	To GL		2…13.2 Hz: ± 1 mm, 13.2…100 Hz: 0.7 gn
Dielectric test voltage conforming to IEC/EN 60664-1	Inputs and outputs	**V**	500 (for 1 minute)
	Inputs and auxiliary supply	**V**	500 (for 1 minute)
	Outputs and AS-Interface line	**kV**	2 for 1 minute between the M12 connectors and earth
	Auxiliary supply and AS-Interface line	**V**	500
	Inputs and AS-Interface line		No insulation
	Outputs and auxiliary supply		No insulation
Resistance to electrostatic discharge	To IEC/EN 61000-4-2	**kV**	8, level 3
Resistance to radiated fields	To IEC/EN 61000-4-3	**V/m**	10, level 3
Surge withstand	To IEC/EN 61000-4-5		1 kV at 2 Ohms (differential mode), 2 kV at 12 Ohms (common mode)
Resistance to transients	To IEC/EN 60100-4-4	**kV**	2, level 3
Degree of pollution	To IEC/EN 60604-4-1		Level 3
Flame resistance	To IEC/EN 60695-2-11		At 750 °C, extinction < 30 s (hot wire test)
Mechanical resistance	Product drop test	**m**	1 (no damage)
Mounting			2 or 3 x M4 screws On 35 mm rail IEC/EN 60715 (for connection base ASI 67FFB01)
Tightening torque	Fixing screws	**Nm**	0.6
Material of metal parts			Stainless steel
Housing material			PBT 30% GF Valox 553

AS-Interface characteristics

AS-Interface version			V2.1
AS-Interface supply		**V**	26.5…31.6
Protection			Against polarity inversion
Connection	To the addressing terminal		Jack connector (for ASI 67FFP●●●) M12 connector (for ASI 67FMP●●●)
Diagnostic signalling	AS-Interface power ON		Green LED
	Auxiliary supply ON		Green LED
	Fault		Red LED
	Input/output status		Yellow LED

Characteristics of V1 compatible interfaces

Interface type		**ASI 67FFP40A**	**ASI 67FFP22A**	**ASI 67FFP04A**	**ASI 67FFP44A**
AS-Interface max. consumption without sensor supply *(1)*		45 mA	32 mA	19 mA	49 mA
AS-Interface profile (I/O code, ID code, ID1, ID2)		00FF	30FF	80FF	70FF
AS-Interface certification		n° 55001	n° 55101	n° 55201	n° 55301
Maximum number of addresses		31			
Number of data bits/number of I/O					
	D0	I1	I1	O1	I1 / O1
	D1	I2	I2	O2	I2 / O2
	D2	I3	O3	O3	I3 / O3
	D3	I4	O4	O4	I4 / O4
Input or output status data bit value	D0 to D3	0 = input or output Off. 1 = input or output On			
Output fallback		Off in the absence of communication			
Parameter bits		Not used			
Product status in the event of a peripheral fault	-Sensor supply overload (I > 200 mA).	Interface inhibited *(2)*			
	Overload on one output	Interface not inhibited *(3)*			Interface inhibited *(2)* *(3)*
Peripheral fault information		–			

(1) Add the consumption of the sensor supply to obtain the total max. consumption on the AS-Interface line.
(2) The status of the inputs is no longer communicated to the master.
(3) All the outputs are off.

AS-Interface cabling system

Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1

1

Characteristics of V2.1 compatible interfaces

Interface type		ASI 67F●P40D	ASI 67F●P22D	ASI 67F●P04D	ASI 67F●P44D/44DY
AS-Interface max. consumption without sensor supply *(1)*		45 mA	32 mA	19 mA	49 mA
AS-Interface profile (I/O code, ID code, ID1, ID2)		00FE	30FE	80FE	70FE (ASI 67F●P44D) 7FFE (ASI 67F●P44DY)
AS-Interface certifications		N° 55001	N° 55101	N° 55201	N° 55301 (ASI 67F●P44D) pending (P44DY)
Maximum number of addresses		31			
Number of data bits/number of I/O	D0	I1	I1	O1	I1 or O1
	D1	I2	I2	O2	I2 or O2
	D2	I3	O3	O3	I3 or O3
	D3	I4	O4	O4	I4 or O4
Input or output status data bit value	D0 to D3	0 = input On / output Off. 1 = input / output On			
Output fallback		Off in the absence of communication			
Parameter bits		Not used			
Product status in the event of a peripheral fault		The interface is not inhibited. The peripheral fault bit is On and can be accessed by the master.			
Peripheral fault information		The peripheral fault bit is On in the case of: - output overload or short-circuit, - absence of auxiliary supply, - sensor supply overload (I > 200 mA). The interface is not inhibited.			

Characteristics of extended A/B addressing interfaces

Interface type		ASI 67F●P40E/40EY	ASI 67F●P22E	ASI 67F●P03E	ASI 67F●P43E/43EY
AS-Interface max. consumption without sensor supply *(1)*		45 mA	32 mA	18 mA	48 mA
AS-Interface profile (I/O code, ID code, ID1, ID2)		0A70 (ASI 67F●P40E) 0A72 (ASI 67F●P40EY)	BA70	8A70	7A70 (ASI 67FpP43E) 7A7E (ASI 67F●P43EY)
AS-Interface certification		n° 55001 (ASI 67F●P40E) pending (P40EY)	n° 55101	n° 55201	n° 55301 (ASI 67F●P43E) pending (P43EY)
Maximum number of addresses		62			
Number of data bits/number of I/O	D0	I1	O1	O1	I1 or O1
	D1	I2	O2	O2	I2 or O2
	D2	I3	I3	O3	I3 or O3
	D3	I4	I4	- Δ *(2)*	I4 Δ *(2)*
Input or output status data bit value	D0 à D3	0 = input or output Off. 1 = input or output On			
Output fallback		Off in the absence of communication			
Parameter bits		Not used			
Product status in the event of a peripheral fault		The interface is not inhibited. The peripheral fault bit is On and can be accessed by the master.			
Peripheral fault information		The peripheral fault bit is On in the case of: output overload or short-circuit, absence of auxiliary supply, sensor supply overload (I > 200 mA). The interface is not inhibited.			

Input characteristics (sensor side)

Sensor type			PNP (2 and 3-wire)
Supply voltage	To IEC/EN 60947-5-1	**V**	18…30
Maximum sensor supply current *(3)*	Via the AS-Interface line	**mA**	200 (for an operating temperature < 40 °C). 150 (for an operating temperature between 40 °C and 70 °C). 100 for ASI 67F●P22●
State 1 guaranteed			U > 11 V and I > 6 mA
State 0 guaranteed			U < 5 V and I < 2 mA
Nominal current (per input)		**mA**	8
Conformity of inputs	To IEC/EN 61131-2		Type 2

Output characteristics (sensor side)

Type			Solid state (PNP transistor)
Supply to actuators	By auxiliary supply	**V**	21.6...27.2 / Protective Extra Low Voltage (PELV)
Maximum drop-out voltage at In		**V**	1
Thermal current per channel		**A**	2
Thermal current per common		**A**	4 (for an operating temperature < 40°C). 2 (for a temperature between 40°C and 70°C)
Leakage current		**µA**	Max. 12 per channel
Protection	Against overload and short-circuits		Thermal (integrated). Individual protection for each channel (automatic reset on elimination of the fault)
	Against polarity inversion		Integrated
Nominal current	DC-12	**A**	2
	DC-13 *(4)*	**A**	2
Response time	OFF to ON	**ms**	< 20
	ON to OFF	**ms**	< 20

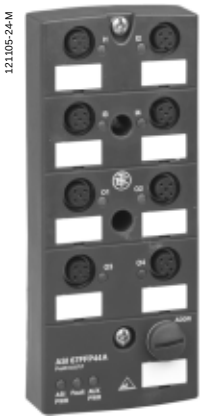
(1) Add the consumption of the sensor supply to obtain the total max. consumption on the AS-Interface line.
(2) O4 must not be used in the program
(3) The supply to the sensors is protected against overload and short-circuits.
(4) An external protection device (diode) must be fitted in parallel with the load for highly inductive applications (L/R > 50 ms).

Presentation, description : page 1/18 | Setting-up : pages 1/19 and 1/20 | References : pages 1/23 to 1/25 | Dimensions : page 1/26 | Schemes, connections : pages 1/27 to 1/30

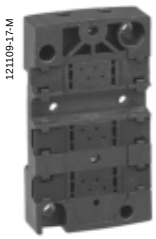
AS-Interface cabling system

Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1

ASI 67FFP40A



ASI 67FFP44A



ASI 67FFB01

ASI 67FFB02

ASI 67FFB03

V1 compatible interfaces

These interfaces replace the XZS CA and XZS DA ranges.
XZS CA and XZS DA interfaces can be replaced when maintenance work is carried out, without any need for adjustments on the PLC and reusing the existing fixing screws (profile and fixing centres are compatible).
The interfaces can also be used to build new installations with V1 masters.
They are only available with standard addressing and do not include any peripheral fault management functions.

Direct connection interfaces via IDC connector *(1)*, for use with a connection base

Addressing	Number of inputs	Number of outputs	Housing type	M12 connector pin arrangement	Reference	Weight kg
Standard	4	–	Compact, 45 mm (4-channel)	Standard	**ASI 67FFP40A**	0.090
	2	2	Compact, 45 mm (4-channel)	Standard	**ASI 67FFP22A**	0.090
	–	4	Compact, 45 mm (4-channel)	Standard	**ASI 67FFP04A**	0.120
	4	4	Flat, 60 mm (8-channel)	Standard	**ASI 67FFP44A**	0.090

Connection bases for direct connection interfaces via IDC connector

For interfaces	Fixing	Rail mounting	Reference	Weight kg
Compact, 45 mm (4-channel)	2 fixing points	Yes	**ASI 67FFB01**	0.044
	4 fixing points (CNOMO centres)	No	**ASI 67FFB02**	0.039
Flat type, 60 mm (8-channel)	4 fixing points (CNOMO centres)	No	**ASI 67FFB03**	0.066

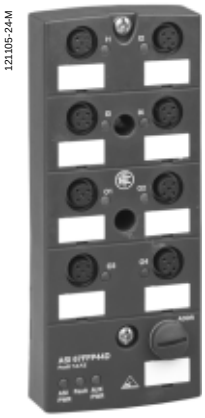
Separate components

Description	Sold in lots of	Unit reference	Weight kg
Sealing plug for M12 connector	10	**ASI 67FACC1**	0.013
Heat shrinkable cable end *(2)*	10	**ASI 67FACC2**	0.020

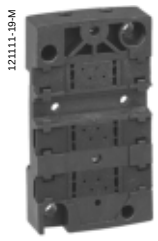
(1) Products supplied with two M12 plugs, not fitted (for 45 mm compact type), with four M12 plugs, not fitted (for 60 mm flat type) and one M12 plug (addressing) fitted.
(2) Enables IP 67 sealing to be achieved at the end of a ribbon cable.

AS-Interface cabling system
Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1

ASI 67FFP40E



ASI 67FFP44D



ASI 67FFB01

ASI 67FFB02

ASI 67FFB03

V2.1 compatible interfaces

These interfaces fully comply with the AS-Interface V2.1 specification:
- Up to 62 interfaces can be associated with each master (extended A/B addressing).
- Peripheral fault management.

They replace and reinforce the ASI M range.
Two types of M12 connector pin arrangement are available for the inputs:
- Standard pin arrangement for sensors with single NO/NC output.
- Dual pin arrangement (Y) for sensors with signal output + alarm output or sensors with single NO output.

Direct connection interfaces via IDC connector *(1)*, for use with a connection base

Addressing	Number of inputs	Number of outputs	Housing type	M12 connector pin arrangement	Reference	Weight kg
Standard	4	–	Compact, 45 mm (4-channel)	Standard	**ASI 67FFP40D**	0.090
	2	2	Compact, 45 mm (4-channel)	Standard	**ASI 67FFP22D**	0.090
	–	4	Compact, 45 mm (4-channel)	Standard	**ASI 67FFP04D**	0.090
	4	4	Flat, 60 mm (8-channel)	Standard	**ASI 67FFP44D**	0.160
				Dual (Y)	**ASI 67FFP44DY**	0.160
Extended A/B	4	–	Compact, 45 mm (4-channel)	Standard	**ASI 67FFP40E**	0.090
				Dual (Y)	**ASI 67FFP40EY**	0.090
	2	2	Compact, 45 mm (4-channel)	Standard	**ASI 67FFP22E**	0.090
	–	3	Compact, 45 mm (4-channel)	Standard	**ASI 67FFP03E**	0.090
	4	3	Flat, 60 mm (8-channel)	Standard	**ASI 67FFP43E**	0.160
				Dual (Y)	**ASI 67FFP43EY**	0.160

Connection bases for direct connection interfaces via IDC connector

For interfaces	Fixing	Rail mounting	Reference	Weight kg
Compact, 45 mm (4-channel)	2 fixing points	Yes	**ASI 67FFB01**	0.044
	4 fixing points (CNOMO centres)	No	**ASI 67FFB02**	0.039
Flat type, 60 mm (8 channel)	4 fixing points (CNOMO centres)	No	**ASI 67FFB03**	0.066

Separate components

Description	Sold in lots of	Unit reference	Weight kg
Sealing plug for M12 connector	10	**ASI 67FACC1**	0.011
Heat shrinkable cable end *(2)*	10	**ASI 67FACC2**	0.020

(1) Products supplied with two M12 plugs, not fitted (for 45 mm compact type), with four M12 plugs, not fitted (for 60 mm flat type) and one M12 plug (addressing) fitted.
(2) Enables IP 67 sealing to be achieved at the end of a ribbon cable.

Presentation, description : page 1/18 | Setting-up : pages 1/19 and 1/20 | Characteristics : pages 1/21 and 1/22 | Dimensions : page 1/26 | Schemes, connections : pages 1/27 to 1/30

AS-Interface cabling system
Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1

DF56440B-19-M

ASI 67FMP40E

121100-24-M

ASI 67FMP43E

V2.1 compatible interfaces (continued)

Interfaces with remote M12 connector *(1)*

Addressing	Number of inputs	Number of outputs	Housing type	M12 connector pin arrangement *(3)*	Reference	Weight kg
Standard	4	–	Compact, 45 mm (4-channel)	Standard	**ASI 67FMP40D**	0.125
	2	2	Compact, 45 mm (4-channel)	Standard	**ASI 67FMP22D**	0.125
	–	4	Compact, 45 mm (4-channel)	Standard	**ASI 67FMP04D**	0.125
	4	4	Flat, 60 mm (8-channel)	Standard	**ASI 67FMP44D**	0.220
				Dual (Y)	**ASI 67FMP44DY**	0.220
Extended A/B	4	–	Compact, 45 mm (4-channel)	Standard	**ASI 67FMP40E**	0.125
				Dual (Y)	**ASI 67FMP40EY**	0.125
	2	2	Compact, 45 mm (4-channel)	Standard	**ASI 67FMP22E**	0.125
	–	3	Compact, 45 mm (4-channel)	Standard	**ASI 67FMP03E**	0.125
	4	3	Flat, 60 mm (8-channel)	Standard	**ASI 67FMP43E**	0.220
				Dual (Y)	**ASI 67FMP43EY**	0.220

Separate components *(2)*

Description	Sold in lots of	Unit reference	Weight kg
Sealing plug for M12 connector	10	**ASI 67FACC1**	0.013
IP 54 tap-off for connecting ASI 67FMP40● to ribbon cable, cable length 0.6 m with M12 straight connector	1	**XZ CG01205D**	0.090
IP67 tap-off for connecting ASI 67FMP (except ASI 67FMP40) to ribbon cable, cable length 0.3 m with M12 straight connector	1	**ASI DCPM12D03**	0.150

(1) Products supplied with two M12 plugs, not fitted (for 45 mm compact type) or with four M12 plugs, not fitted (for 60 mm flat type). These are monobloc products; there is no need to order a connection base.
(2) For other tap-off accessories, see page 4/6 (connection accessories).
(3) Connector for connecting sensors/actuators.

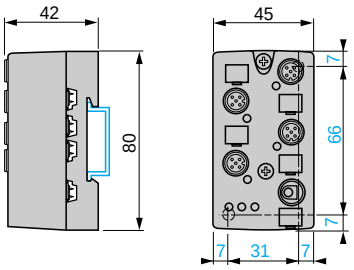
AS-Interface cabling system

Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1

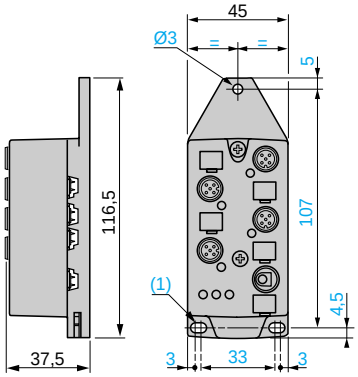
Assembled products (direct connection modules)

4-channel interfaces with connection base ASI 67FFB01

Can be mounted on 35 mm ⊓⊔ rail.

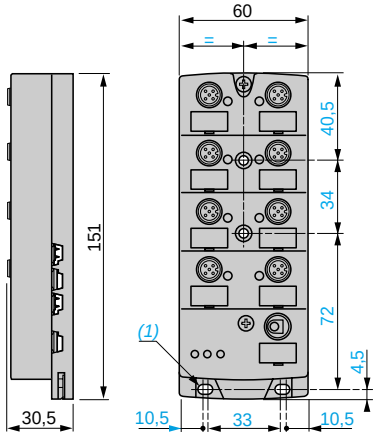


4-channel interfaces with connection base ASI 67FFB02



(1) 2 elongated holes Ø 4.6 x 3.

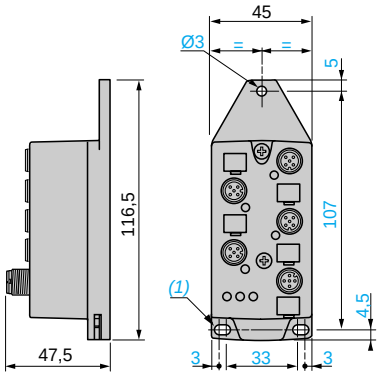
8-channel interfaces with connection base ASI 67FFB03



(1) 2 elongated holes Ø 4.6 x 3.

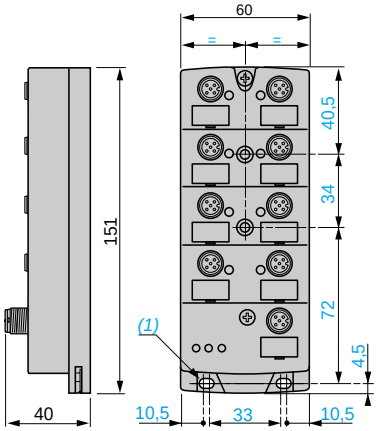
Monobloc products (remote connection modules)

4-channel interfaces



(1) 2 elongated holes Ø 4.6 x 3.

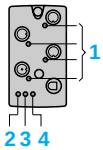
8-channel interfaces



(1) 2 elongated holes Ø 4.6 x 3.

Explanation of LEDs

4-channel interfaces

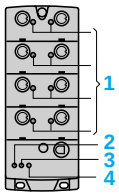


1 I/O LED

I/O ON: ⊗, I/O OFF: ⊗

2 AS-Interface power On LED (ASI PWR)
3 Fault LED
4 AUX power On LED (AUX PWR)

8 channel interfaces



1 I/O LED

I/O ON: ⊗, I/O OF : ⊗

2 AS-Interface power On LED (ASI PWR)
3 Fault LED
4 AUX power On LED (AUX PWR)

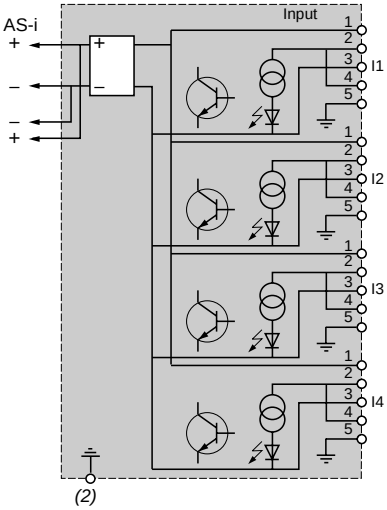
Status		ASI PWR	Fault	AUX PWR
⊗	Off	Power off or reversed polarity on the AS-Interface line	OK *(1)*	Power off or reversed polarity on the AUX line *(4)*
⊗	ON	OK	No communication *(2)*	OK *(4)*
⊗	Flashing	–	Peripheral fault *(3)*	–

(1) No fault indication if power off or reversed polarity on the AS-Interface line.
(2) Master in STOP condition, incorrect IO/ID configuration, Slave at address 0.
(3) Sensor supply or output overload, undervoltage or reversed polarity on AUX line, only for ASI 67F●P●●D/ASI 67F●P●●E.
(4) LED not working on ASI 67F●P40●●.

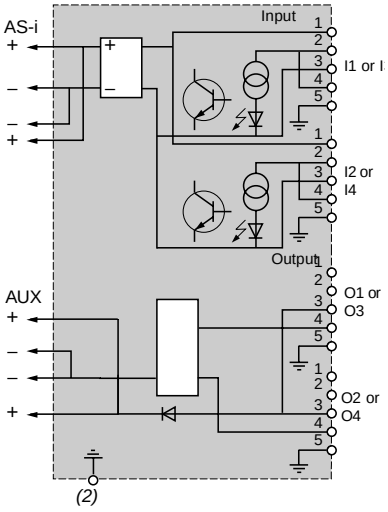
AS-Interface cabling system

Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1

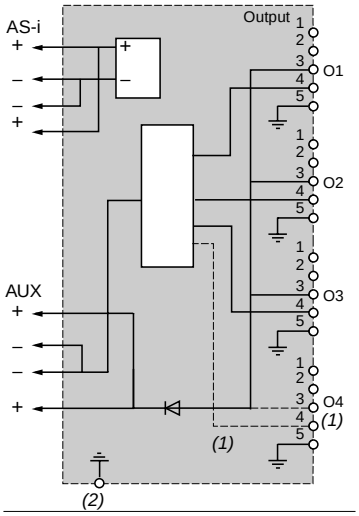
ASI 67FFP40●



ASI 67FFP22●

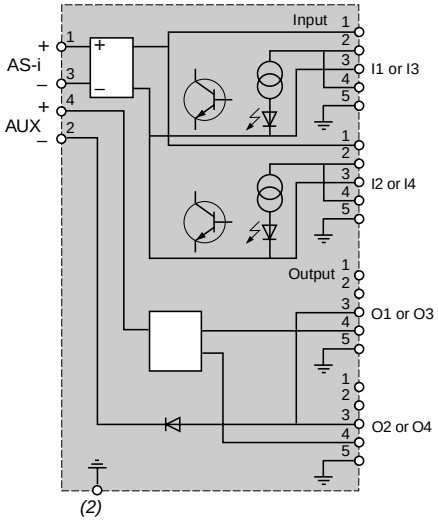


ASI 67FFP03●, ASI 67FFP04●

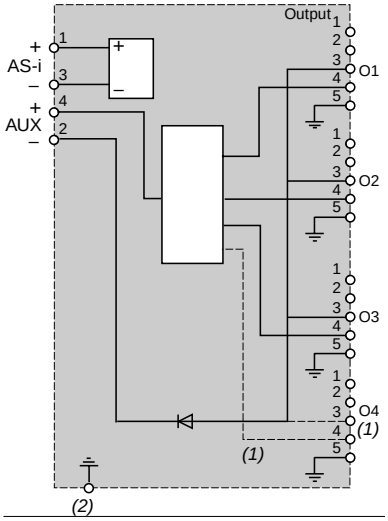


(1) Links on ASI 67FFP04● only

ASI 67FMP22●

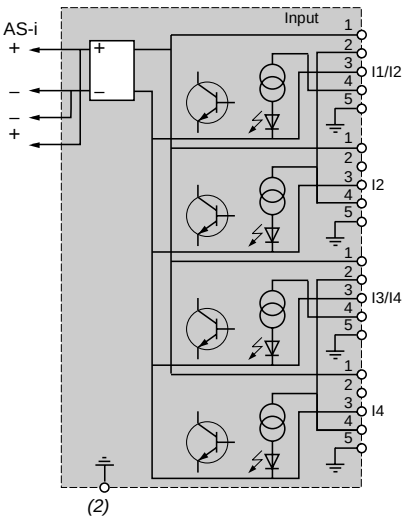


ASI 67FMP03●, ASI 67FMP04●

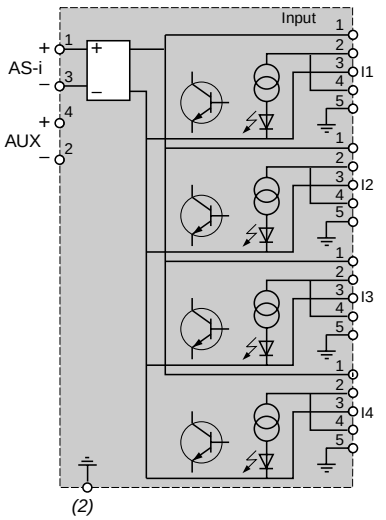


(1) Links on ASI 67FMP04● only

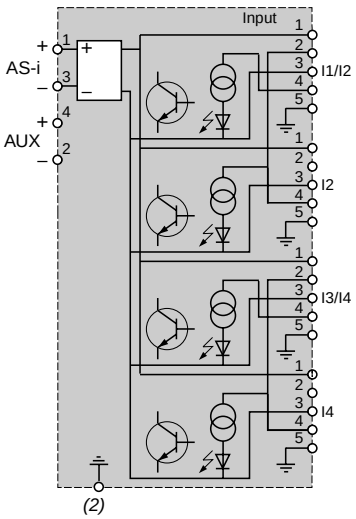
ASI 67FFP40EY



ASI 67FMP40●



ASI 67FMP40EY



(2) Fixing screw making it possible to connect all no. 5 pins to earth.

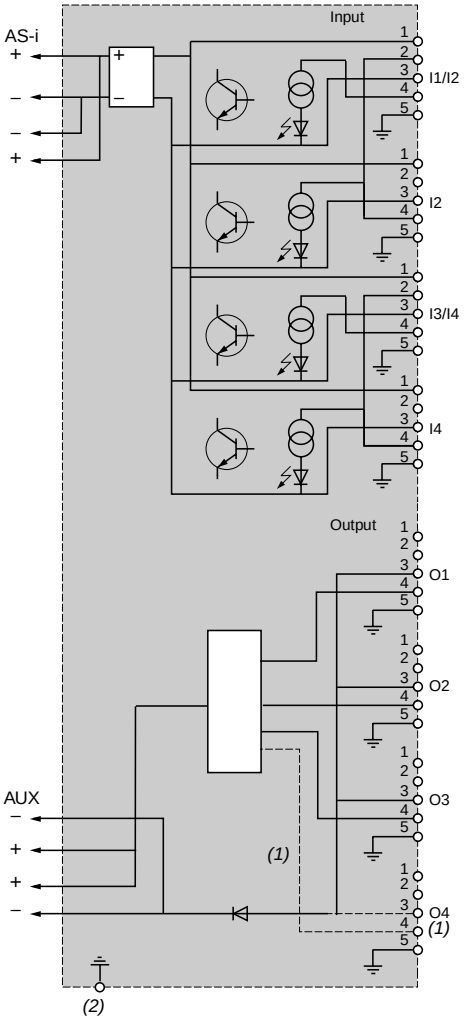
AS-Interface cabling system

Advantys, interfaces for generic products

IP 67 I/O, AS-Interface V2.1

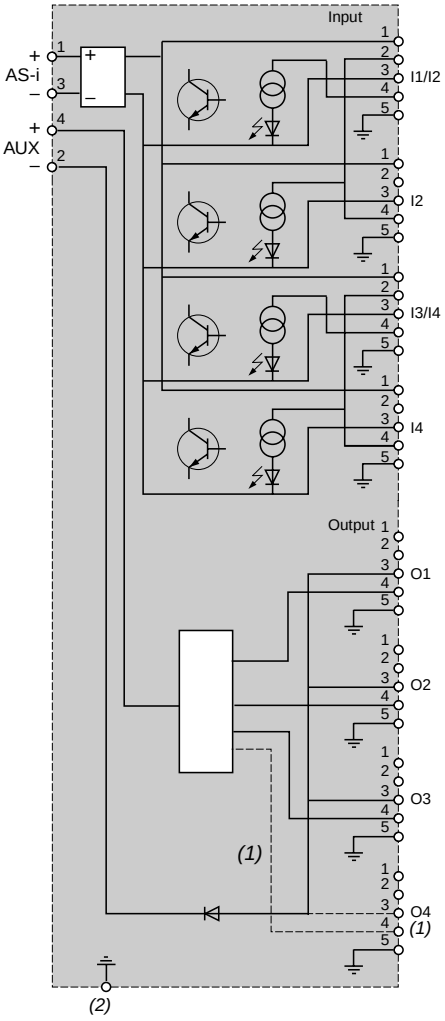
1

ASI 67FFP43EY, ASI 67FFP44DY



(1) Links on ASI 67FFP43EY only
(2) Fixing screw making it possible to connect all no. 5 pins to earth.

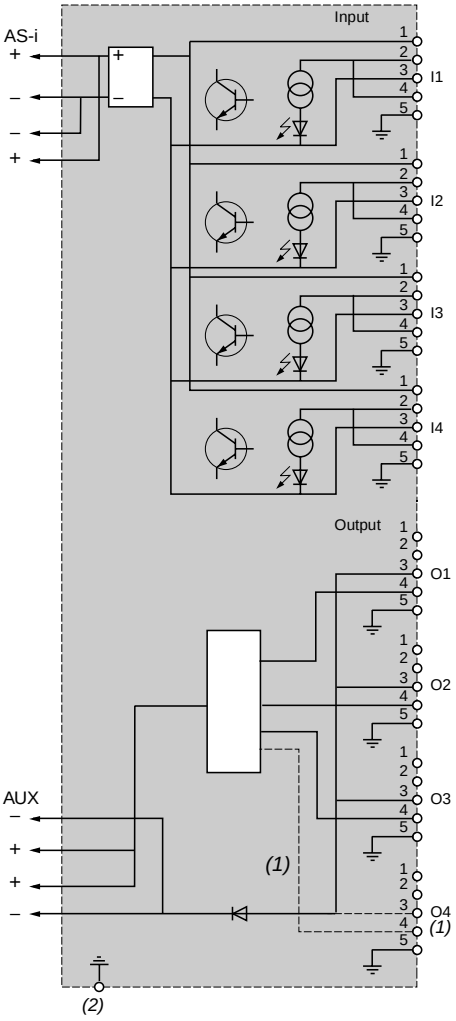
ASI 67FMP43EY, ASI 67FMP44DY



(1) Links on ASI 67FMP43EY only
(2) Fixing screw making it possible to connect all no. 5 pins to earth.

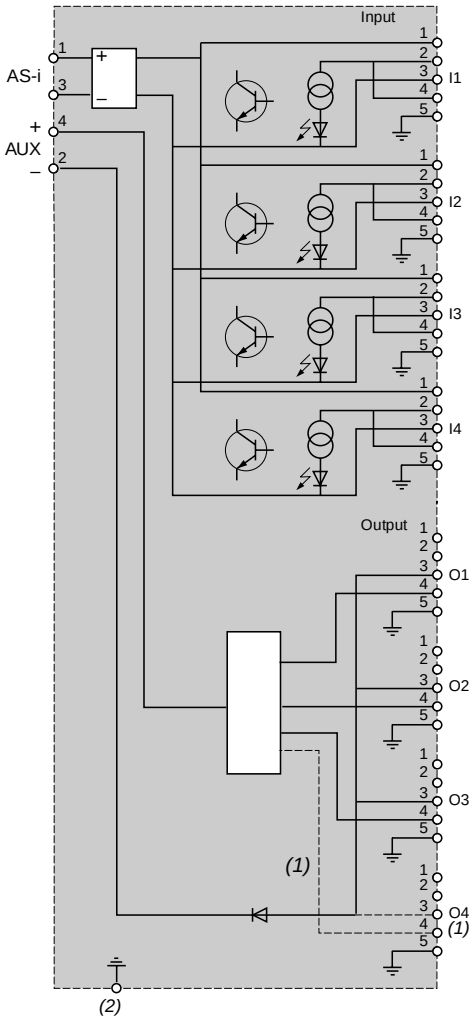
AS-Interface cabling system
Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1

ASI 67FFP43E, ASI 67FFP44●



(1) Links on ASI 67FFP43E only
(2) Fixing screw making it possible to connect all no. 5 pins to earth.

ASI 67FMP43E, ASI 67FMP44D



(1) Links on ASI 67FMP43E only
(2) Fixing screw making it possible to connect all no. 5 pins to earth.

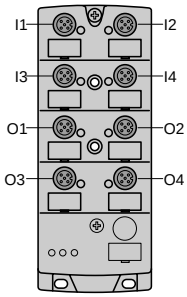
AS-Interface cabling system

Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1

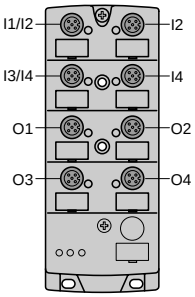
1

Connector locations

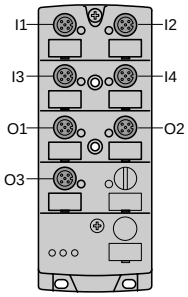
ASI 67FFP44●/FMP44●



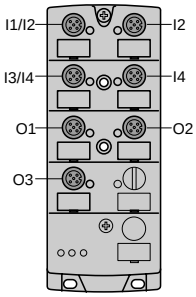
ASI 67FFP44DY/FMP44DY



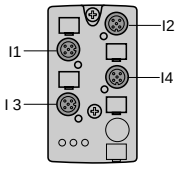
ASI 67FFP43E/FMP43E



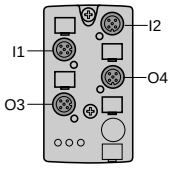
ASI 67FFP43EY/FMP43EY



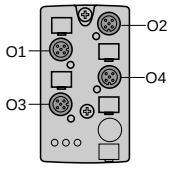
ASI 67FFP40●
ASI 67FMP40●



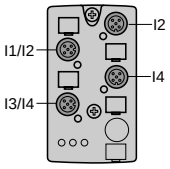
ASI 67FFP22A/22D
ASI 67FMP22A/22D



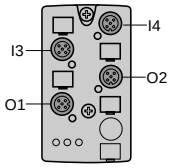
ASI 67FFP04●
ASI 67FMP04●



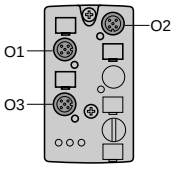
ASI 67FFP40EY
ASI 67FMP40EY



ASI 67FFP22E
ASI 67FMP22E



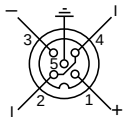
ASI 67FFP03E
ASI 67FMP03E



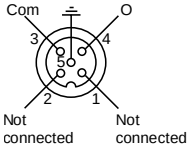
Pin arrangement of connectors for connecting sensors/actuators (viewed from product side)

ASI 67F●P●●●

Connector I1...I4

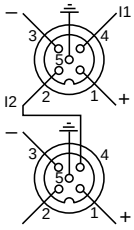


Connector O1...O4



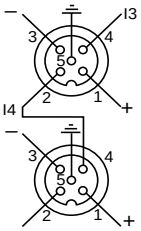
ASI 67F●P●●●Y

Connector I1/I2



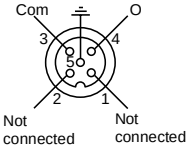
Connector I2

Connector I3/I4

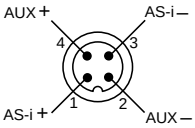


Connector I4

Connector O1...O4

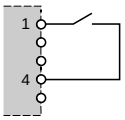


Pin arrangement of connectors AS-i AUX (viewed from product side) (ASI 67FMP●●●)

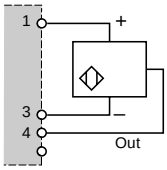


Example of input connections.

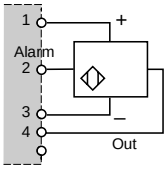
Volt-free contact or 2-wire sensor



3-wire sensor

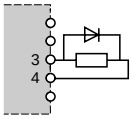


Sensor signal + alarm

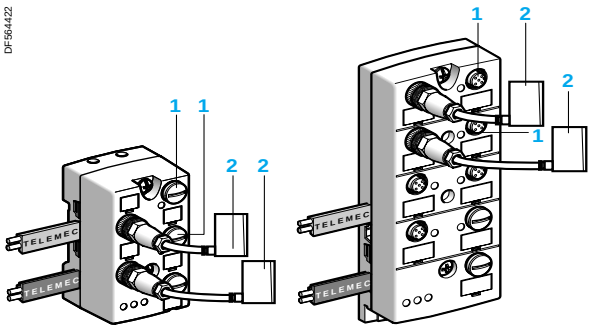


Example of output connections

Load



Example of connection of sensors with signal + alarm output to interfaces with dual pin arrangement



1 Do no use this connector
2 Sensor with signal + alarm output
examples: XU MO●●●, XU KO●●●, XU XO●●●

AS-Interface cabling system
Advantys, interfaces for generic products
IP 67 I/O, AS-Interface V2.1

The Advantys ASI 67F interface range can be used to fully replace the range of V1 and V2.1 interfaces with the following references: XZS ●●● and ASI M●●●.

Substitution table

Old range		New range	
Interface	**Connection base**	**Interface**	**Connection base**
ASI ME2I2O	ASI B4VM12	ASI 67FFP22D	ASI 67FFB02
ASI ME2I2OE	ASI B4VM12	ASI 67FFP22E	ASI 67FFB02
ASI ME4I	ASI B4VM12	ASI 67FFP40D	ASI 67FFB02
ASI ME4I4O	ASI B8VM12	ASI 67FFP44D	ASI 67FFB03
ASI ME4IE	ASI B4VM12	ASI 67FFP40E	ASI 67FFB02
ASI ME4O	ASI B4VM12	ASI 67FFP04A	ASI 67FFB02
XZS CA44D21	Integrated	ASI 67FFP44A	ASI 67FFB03
XZS DA04D32	XZS DE1133	ASI 67FFP04A	ASI 67FFB01
XZS DA22D32	XZS DE1133	ASI 67FFP22A	ASI 67FFB01
XZS DA40D3	XZS DE1113	ASI 67FFP40A	ASI 67FFB01
XZS DA40D3	XZS DE1133	ASI 67FFP40A	ASI 67FFB01
ASI DCPACC3	–	ASI 67FACC1	–
XZL G102	–	ASI 67FACC1	–

Replacement of older interfaces with the Advantys ASI 67F range during maintenance operations has the following advantages:
- The old product fixings can be reused.
- The installation can be restarted without having to adjust the PLC and without an addressing terminal (provided that the PLC is configured for automatic addressing and that the interfaces are replaced one by one).
- Identical behaviour of old and new range interfaces in the event of a peripheral fault (sensor or output supply overload, absence of auxiliary voltage).

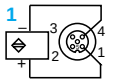
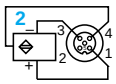
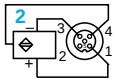
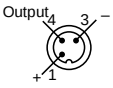
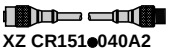
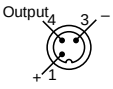
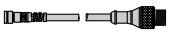
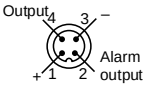
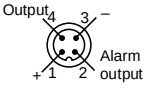
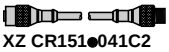
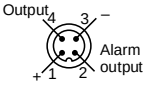
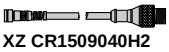
Note: old connection bases are not compatible with new interfaces and old interfaces are not compatible with new connection bases.
Both the interface and connection base must be replaced in all cases.

AS-Interface cabling system

Connection of sensors and actuators to Advantys ASI 67F● interfaces

1

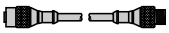
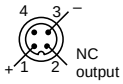
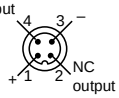
Conventional sensors *(1)*

Proximity sensors			Jumper cables or pre-wired connectors *(2)*	Compatibility with interfaces	
Sensor types	**Functions possible when unit is connected on the AS-Interface cable**	**Sensor connection method**		**ASI 67F●P●●● Standard pin arrangement**	**ASI 67F●P●●●Y Dual (Y) pin arrangement**
XS● (inductive), XT● (capacitive) 2-wire (scheme 1) **or 3-wire** (scheme 2) **PNP type**	NO output or NC output	Cable	**XZ CC12MCM40B**  **XZ CC12MDM40B** 	Yes *(4)*	Yes *(4)*
XS● ●●●●●● M12 3-wire PNP type	NO output only	M12 connector	M12 M12 **XZ CR151●040A2**		
	NC output only	M12 connector	M12 M12 **XZ CR151●040E2**		No
XS● ●●●●●● M8 3-wire PNP type	NO or NC output	M8 connector	M8 M12 **XZ CR150●040G2**		Yes *(4)*
Photo-electric sensors					
XU● XUB● XUK● XUX● 3-wire PNP type	NO or NC output	Cable	**XZ CC12MCM40B**  **XZ CC12MDM40B**		
Osiris Design 18, XUB●●● M12 Osiris Compact design XU 3-wire PNP type	NO or NC output	M12 connector	M12 M12 **XZ CR151●040A2** 		
Cylindrical Ø 18 mm XUK●●● M12 XUX●●● M12 3-wire PNP type	NO or NC output	M12 connector	M12 M12  **XZ CR151●040A2** 		
XUM0●●● M8 XUDA●●● M8 4-wire PNP type	NO or NC output with alarm	M8 connector	M8 M12  **XZ CR1509041J2** 	No	Yes *(3)*
XUK0●●● M12 4-wire PNP type	NO or NC output with alarm	M12 connector	M12 M12 **XZ CR151●041C2** 		
XUX0●●● M12 4-wire PNP type	NO or NC output with alarm	M12 connector	M12 M12  **XZ CR151●041C2** 		
Osiris Fibre optic design XUDA●●● M8, Osiris Miniature design XUM●●● M8, Osiris Fork design XUV K	NO or NC output	M8 connector	M8 M12  **XZ CR1509040H2**	Yes *(4)*	Yes *(4)*

(1) Check the alternatives for connecting photo-electric sensors and proximity sensors to the splitter boxes. See compatibility table on page 1/37.
*(2) Length: 2 m. To order a jumper cable or pre-wired connector with a 1 m long cable, replace the last number of the reference (2) by **1**.*
*Example: reference XZ CR151●040A2 becomes **XZ CR151●040A1** with a 1 m long cable.*
*To order a straight input connector, replace the ● by the number **1**.*
*To order an elbowed input connector, replace the ● by the number **2**.*
(3) 2 sensors maximum connected to connectors I1/I2 and I3/I4 of the interface (connectors I2 and I4 must not be used).
(4) 1 sensor per M12 input connector on the interface.

AS-Interface cabling system
Connection of sensors and actuators to Advantys ASI 67F● interfaces

Conventional sensors *(1)* (continued)

Ultrasonic sensors			Jumper cables or pre-wired connectors *(2)*	Compatibility with interfaces	
Sensor types	**Functions possible when unit is connected on the AS-Interface cable**	**Sensor connection method**		**ASI 67F●P●●● Standard pin arrangement**	**ASI 67F●P●●●Y Dual (Y) pin arrangement**
XX 512 A2 PAM8 **3-wire PNP type**	NO	M8 connector	M8 M12 **XZ CR150●040G2**	Yes *(4)*	Yes *(4)*
XX 518 A3 PAM12 **XX7 F1 A2 PAL01M12** **XX7 K1 A2 PAM12** **XX7 V1 A1 PAM12** **3-wire PNP type**	NO	M12 connector	M12 M12  **XZ CR151●040A2**		
XX 630 A● PCM12 **3 and 4-wire PNP type**	NO, 3-wire type	M12 connector	M12 M12 **XZ CR151●040A2** NO output 		
	NC, 3-wire type	M12 connector	M12 M12 **XZ CR151●040E2** 	Yes *(4)*	No
	NO + NC, 4-wire type	M12 connector	M12 M12 **XZ CR151●041C2** NO output 	No	Yes *(3)*

(1) Check the alternatives for connecting ultrasonic sensors to the splitter boxes. See compatibility table on page 1/37.
*(2) Length: 2 m. To order a jumper cable or pre-wired connector with a 1 m long cable, replace the last number of the reference (2) by **1**.*
*Example: reference XZ CR151●040A2 becomes **XZ CR151●040A1** with a 1 m long cable.*
*To order a straight input connector, replace the ● by the number **1**.*
*To order an elbowed input connector, replace the ● by the number **2**.*
(3) 2 sensors maximum connected to connectors I1/I2 and I3/I4 of the interface (connectors I2 and I4 must not be used).
(4) 1 sensor per M12 input connector on the interface.

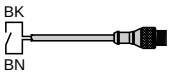
AS-Interface cabling system

Connection of sensors and actuators to Advantys ASI 67F● interfaces

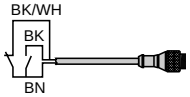
1

Conventional sensors *(1)* (continued)

Limit switches

Sensor types	Functions possible when unit is connected on the AS-Interface cable	Sensor connection method	Jumper cables or pre-wired connectors *(2)*	Compatibility with interfaces: ASI 67F●P●●● Standard pin arrangement	Compatibility with interfaces: ASI 67F●P●●●Y Dual (Y) pin arrangement
XCMD● **ZCMD●**	N/C contact	M12 connector 4-pin	M12 M12 **XZ CR151●062B2**	Yes *(4)*	No
	N/C contact	M12 connector 5-pin	M12 M12 **XZ CR151●062B2**		
	N/C contact or N/O contact	Pre-cabled	 **XZ CC12M●M40B**	Yes *(4)*	Yes *(4)*
XCM●N **XCMD●** **ZCMD●**	N/C + N/O contacts or N/C + N/C contacts	Pre-cabled	 **XZ CC12M●M40B**	No	Yes *(3)*
XCK ●D	N/C contact	M12 connector 5-pin	M12 M12 **XZ CR151●062B2**	Yes *(4)*	No
XCK ●P	N/C contact	M12 connector 4-pin	M12 M12 **XZ CR151●062B2**		
XCK ●P **XCK ●D** **XCK ●N** **XCK T●** **XCK L●** **XCK M●** **XCK J●** **XCK S●**	N/C contact or N/O contact	Terminals	 **XZ CP1541L2** (4 contacts) **XZ CP1564L2** (5 contacts)	Yes *(4)*	Yes *(4)*

Electromechanical pressure and vacuum switches

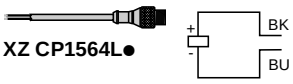
XML ●●●●●●S11	N/C + N/O contacts	Terminals	 **XZ CP1541L2** **XZ CP1564L2**	No	Yes *(3)*
XML ●●●●●●C11	N/O contact	DIN connector	DIN 4350A M12 **XZ CR1523062K2**	Yes *(4)*	Yes *(4)*

(1) Check the alternatives for connecting limit switches and pressure/vacuum switches to the splitter boxes. See compatibility table on page 1/37.
*(2) Length: 2 m. To order a jumper cable or pre-wired connector with a 1 m long cable, replace the last number of the reference (2) by **1**.*
*Example: reference XZ CR151●040A2 becomes **XZ CR151●040A1** with a 1 m long cable.*
*To order a straight input connector, replace the ● by the number **1**.*
*To order an elbowed input connector, replace the ● by the number **2**.*
(3) 2 sensors maximum connected to connectors I1/I2 and I3/I4 of the interface (connectors I2 and I4 must not be used).
(4) 1 sensor per M12 input connector on the interface.

AS-Interface cabling system

Connection of sensors and actuators to Advantys ASI 67F● interfaces

Conventional actuators (continued)

Actuators		Jumper cables or pre-wired connectors *(1)*	Compatibility with interfaces	
Other actuators	**Actuator connection method**		**ASI 67F●P●●● Standard pin arrangement**	**ASI 67F●P●●●Y Dual (Y) pin arrangement**
	Screw terminals	 **XZ CP1564L●**	Yes	Yes
	M8 or M12 connector *(1)*	**XZ CR15●●●●●●**		

(1) Select the appropriate jumper cable according to the connector wiring (See pages 4/8 to 4/12).

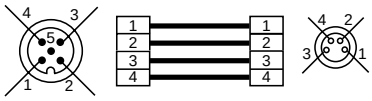
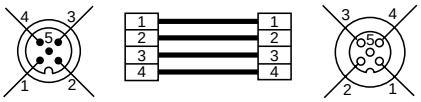
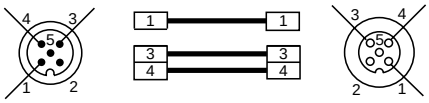
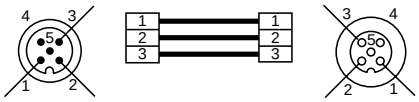
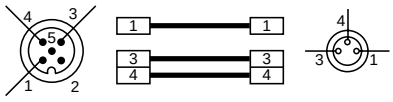
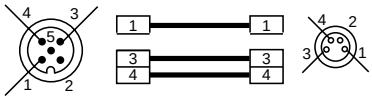
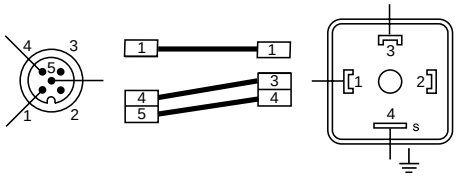
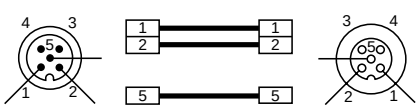
AS-Interface cabling system

Use of jumper cables

For connection of conventional sensors

1

Jumper cables

Connection	Conventional sensors
XCR ●●J● 	■ Photo-electric sensors, 4-wire PNP type **XUM0●●● M8** and **XUDA●●● M8**. NO or NC output with alarm function.
XZ CR●●●●C● 	■ Photo-electric sensors, 4-wire PNP type **XUK0●● M12** and **XUX0●● M12**. NO or NC output with alarm function. ■ Ultrasonic sensors, 4-wire PNP type **XX630A●PC M12**. NO + NC output. ■ Limit switches **XCMD●** and **XCKP●**. N/C + N/O contact.
XZ CR●●●●A● 	■ Photo-electric sensors, 3-wire PNP type, cylindrical **XUK ●●M12** and **XUX ●●M12**. ■ Photo-electric sensors, 3-wire PNP type **XUB ●●●M12**, Osiris. ■ Ultrasonic sensors, 3-wire PNP type **XX7●●●●P●**, **XX518A3P●** and **XX630●PCM12**. NO output only. ■ Proximity sensors **XS●●M12**, 3-wire PNP type. NO output only.
XZ CR●●●●E● 	■ Ultrasonic sensors, 3-wire PNP type **XX630A●PCM12**. NC output. ■ Proximity sensors **XS●●M12**, 3-wire PNP type. NC output only.
XZ CR●●●●G● 	■ Ultrasonic sensors, 3-wire PNP type **XX512A2PAM8**. NO output. ■ Proximity sensors **XS●●M**, 3-wire PNP type. NO or NC output.
XZ CR●●●●H● 	■ Photo-electric sensors, 3-wire PNP type, Osiris Fibre optic design **XUDA●●●M8** and Osiris Miniature design **XUM●●●M8** and Osiris Fork design **XUV K**. “Light on” switching only. NO or NC output.
XZ CR●●●●K● 	■ Electromechanical pressure or vacuum switches **XML●●●C11**. N/O contact only.
XZ CR●●●B● 	■ Limit switches **XCKD●, XCMD●** and **XCKP●**. N/C + N/O or N/C + N/C contact.

AS-Interface cabling system

Connection of sensors and actuators on the AS-Interface line

Compatibility table for connection of Telemecanique brand sensors

Interface type	ASI 67F●P40●/04●/03●/44●/43●			ASI 67F●P22●		
Maximum number of sensors that can be connected *(1)*	4			2		
Maximum current for the 4 or 2 inputs	200 mA			100 mA		
Inductive proximity sensors						
XS● ●●●●D●●● (2-wire)						
XS● ●●●●P●●● (3-wire, PNP)						
Capacitive proximity sensors						
XT1 M12P●●●, XT4 P12P●●●						
XT1 M18P●●●, XT4 P18P●●●						
XT1 M30P●●●, XT4 P30P●●●						
XT7 C40PC●●●						
Photo-electric sensors	**Thru-beam**	**Reflex**	**Diffuse**	**Thru-beam**	**Reflex**	**Diffuse**
XUB ●●P●●●● (3-wire, PNP)						
XUB H01353●						
XU● N18PP341●						
XU2 M18AP20D						
XU2 P18PP340DL						
XU5 M18U1D						
XUM ●AP●●●● (3-wire, PNP)						
XUM H15353●						
XUM W1K, XUV K●●●						
XUK ●AK●●●● (only with PNP output selected)						
XUK AP●●●● (3-wire, PNP)						
XUK T1KSM●●						
XUX ●AK●●●● (only with PNP output selected)						
XUM ●AP●●●● (3-wire, PNP)						
XUC ●AK●●● (only with PNP output selected)						
XUD A●●						
XUV H00●●●●						
XUR C●●●●●● **XUR K●●●●●●**						

(1) See application conditions in the table above.
Not applicable to XUV T●●.

Connection of the maximum number of sensors possible.

Note: the maximum number of sensors that can be connected is limited by the maximum rated current of the splitter box. Check the consumption of the products.

Not applicable.

Contents

2 - Dedicated components

Selection guide: dedicated components for control . . . . . page 2/2

Selection guide: dedicated components for dialogue . . . . . page 2/4

■ Communication module for TeSys model U starter-controller . . . . . *page 2/6*

■ Tego Power communication module . . . . . *page 2/9*

■ AS-Interface V1 for D.O.L. starters, LA9 Z . . . . . *page 2/13*

■ Enclosed D.O.L. starters, in insulated enclosures . . . . . .

□ With rotary control knob, with blue handle on black background
- non-reversing, model LF1 P . . . . . *page 2/26*
- reversing, model LF2 P . . . . . *page 2/26*

□ With pushbutton control
- non-reversing, model LF1 M . . . . . *page 2/27*
- reversing, model LF2 M . . . . . *page 2/27*

□ With rotary control knob, with red handle on yellow background
- non-reversing, model LF7 P . . . . . *page 2/28*
- reversing, model LF8 P . . . . . *page 2/29*

■ Enclosed D.O.L. starters, in metal enclosures

□ With rotary control knob, model LF1 MP or LF2 MP . . . . . *page 2/26*

□ With pushbutton control, model LF1 MM or LF2 MM . . . . . *page 2/27*

■ Tego Dial for Human-Machine interfaces on AS-Interface cabling system . . . . . *page 2/45*

■ Control stations and adapter for control and signalling units . . . . . *page 2/47*

■ Illuminated indicator banks, type XVB

□ AS-Interface base units . . . . . *page 2/52*

□ Illuminated lens units, steady . . . . . *page 2/52*

□ Illuminated lens units, with “flash” discharge tube . . . . . *page 2/53*

□ Accessories . . . . . *page 2/54*

AS-Interface cabling system
Dedicated components
For control

Description	Communication module for TeSys model U starter-controller	Tego Power communication module
Degree of protection	IP 20	
Functions	For D.O.L. starting, while providing protection and control for single-phase or 3-phase motors, and control of the application	For controlling up to 8 “Quickfit System” motor starters
Connection to AS-Interface	By removable screw connector	By 2-way plug-in connector
Supply for the outputs (coils)	Via ⎓ 24 V external power supply	Via the AS-Interface line
Type	**ASI LUFC5**	**APP 1CAS2**
Pages	2/6 and 2/7	2/9

Dedicated interfaces for motor starters	Reversing or non-reversing D.O.L. starters
IP 20	IP 55/IP 65
For building reversing, non reversing or 2-speed motor starters	For motor starter control as near as possible to the motor
By Insulation Displacement Connector (IDC)	By M12 male connector
Via ⎓ 24 V external power supply	Via ⎓ 24 V external power supply (LF1/LF2/LF7/LF8) Via the AS-Interface line (LF1/LF2)
LA9 Z3●●	**LF●**
2/13	2/26 to 2/31

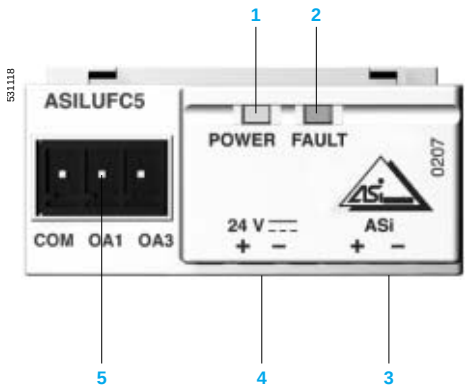
AS-Interface cabling system
Dedicated components
For dialogue

2

Description	Dedicated interface for Tego Dial
Degree of protection	IP 20
Functions	For connection of control and signalling units to the Tego Dial system
Connection to AS-Interface	By removable screw clamp terminal block
Supply for the outputs (pilot lights) **and illuminated units**	Via ⎓ 24 V external power supply
Type	**APE 1FASI1**
Pages	2/45

Control stations	Illuminated indicator banks
IP 65	IP 65
Control stations with 2 flush, spring return pushbuttons, illuminated or not	Indicator banks, modular, with illuminated lens units or audible signalling units (1 to 4 illuminated units)
By M12 male connector	By M12 male connector or 1 m cable + M12 male connector
Via the AS-Interface line	Via the AS-Interface line or via ⎓ 24 V external power supply
XAL S200●	**XVB C●●**
2/47	2/52 to 2/54

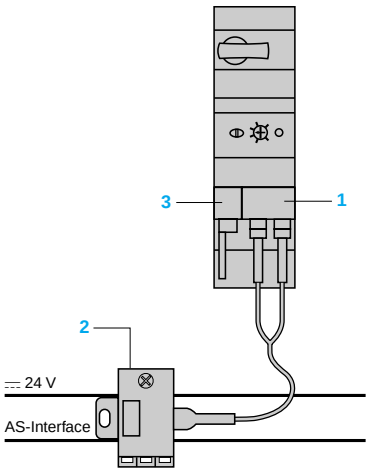
AS-Interface cabling system
Dedicated components
Communication module for Tesys model U starter-controller



1 Green LED: AS-Interface voltage present
2 Red LED: AS-Interface or module fault
3 Yellow connector for connection to the AS-Interface system
4 Black connector for connection to a ⎓ 24 V auxiliary power supply
5 Outputs for starter commands

Series type connection

Architecture



1 Communication module ASI LUF C5
2 Tap-off XZ CG0142
3 Pre-wired coil connection LU9B N11C

Information transmitted by the AS-Interface system

AS-Interface profile		7.D.F.0	
Data bits (command)	Bit value	= 0	= 1
	Command D0 (O)	Stop forward	Forward running
	Command D1 (O)	Stop reverse	Reverse running
	Command D2 (O)	Not used	Not used
	Command D3 (O)	Not used	Not used
Data bits (status)	Bit value	= 0	= 1
	Status D0 (I)	Not ready or fault	Ready
	Status D1 (I)	Stopped	Running
	Status D2 (I)	Not used	Not used
	Status D3 (I)	Not used	Not used

AS-Interface communication module

The AS-Interface communication module makes it easy to connect starter-controllers to the AS-Interface cabling system, and therefore allows remote control and command of these starter-controllers.

The various operating states of the module (AS-Interface voltage present, communication fault, addressing fault,…) are indicated on the front panel by 2 LEDs (green 1 and red 2).

Operation of the module is continuously monitored by auto-testing, in a way that is totally transparent to the user.

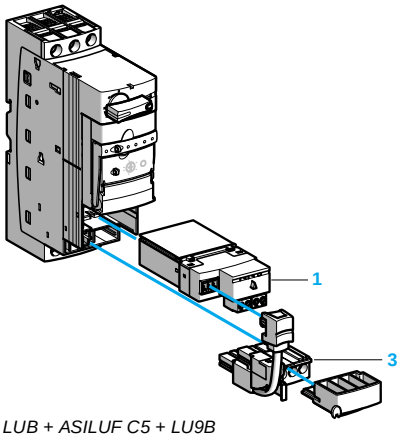
The incorporation of AS-Interface V.2.1 functions allows diagnostics to be performed on the module, either remotely via the line or locally via the ASI TERV2 addressing terminal.

The communication module must be connected to a ⎓ 24 V auxiliary power supply and must be used in conjunction with a ⎓ 24 V control unit, LUC● ●●BL.
The product is supplied with a yellow connector 3 for connection to the AS-Interface system, a black connector 4 for connection to the ⎓ 24 V auxiliary supply and a black connector 5 for connection of the outputs.

Description	Item	Reference	Weight kg
Communication module	1	**ASI LUF C5**	0.065

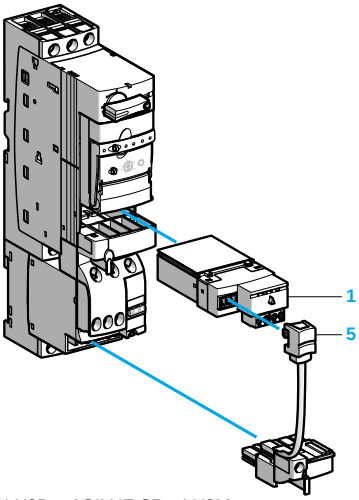
AS-Interface cabling system
Dedicated components
Communication module for Tesys model U starter-controller

510300



LUB + ASILUF C5 + LU9B

520799

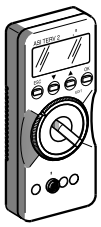


LU2B + ASILUF C5 + LU9M

520898

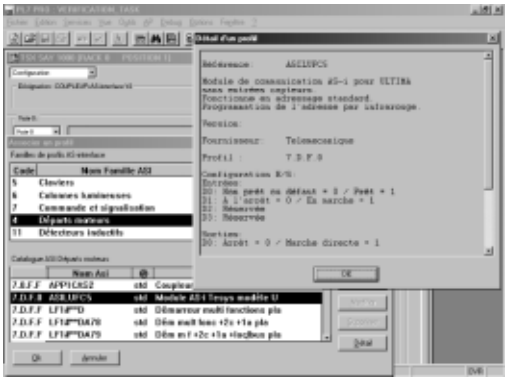
XZ MC11

520899



ASI TERV2

561421



Configuration example with Premium TSX SAY 1000 module

Pre-wired components simplify wiring and reduce wiring errors.

Connection of communication module output terminals to the coil terminals

By pre-wired connector or wire link.

■ **Pre-wired connector: pre-wired coil connection**
The use of a power base without pre-wired control circuit connections is recommended.

Description	For use with power base	Item	Reference	Weight kg
Pre-wired coil connection	LUB ●●	3	**LU9B N11C**	0.045
	LU2B ●●	5	**LU9M RC**	0.030

■ **Wire link**
Allows insertion, for example, of an emergency stop control or a voltage interface. This type of connection must be used for a reversing starter-controller assembled using an LU6M reverser block for separate mounting. When reverser block LU6M and the power base are mounted side-by-side, a pre-wired connector LU9M RC may be used.

Connection of the communication module *(1)*

Achieved by using a tap-off for connection to 2 ribbon cables:
■ 1 for AS-Interface (yellow).
■ 1 for separate ⎓ 24 V supply (black).

Description	Length m	Reference	Weight kg
Tap-off	2	**XZ CG0142**	0.265

Consoles and cable adaptors

Description	Reference	Weight kg
Addressing console Battery operated. Battery charger supplied AS-Interface V.1 and V.2.1 compatible	**XZ MC11**	0.550
Adjustment and diagnostics console Runs on LR6 batteries Allows addressing of AS-Interface V.2.1interfaces and diagnostics	**ASI TERV2**	0.500
Cable adaptor For console XZ MC11	**XZ MG12**	0.070

Software set-up

AS-Interface configuration is carried out using PL7 Micro/Junior/Pro software. From the module declaration screen, it is possible to configure all the slave devices corresponding to all the AS-Interface I/O.
Configuration is carried out by following the instructions on the screen.

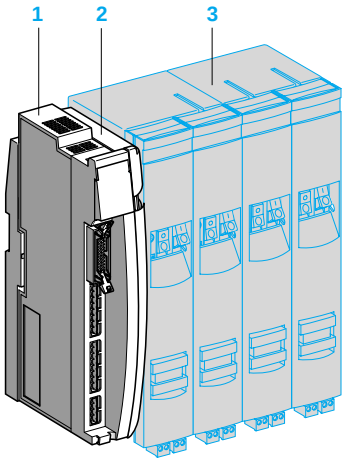
TeSys model U user's manual *(2)*

Application	Language	Reference	Weight kg
On CD-Rom	Multi-language *(3)*	**LU9 CD1**	0.022

(1) Degree of protection IP 54. Connection by 4 x 0.34 mm² wires.
Black wire: +24 V.
White wire: 0 V.
Blue wire: AS-Interface (–).
Brown wire: AS-Interface (+).
(2) The CD-Rom contains user's manuals for the AS-Interface and Modbus communication modules, multifunction control units and gateway modules, as well as the gateway programming software.
(3) English, French, German, Italian, Spanish

AS-Interface cabling system
Dedicated components
Tego Power communication module

Presentation



Communication modules are used to send I/O data from a Tego Power motor power-starter configuration to a PLC.
The communication module is selected according to the type of connection required:
- in parallel mode (modules, terminal blocks or HE 10),
- or in serial mode on a bus or network (AS-Interface line, INTERBUS, Profibus DP, CAN Open or Device Net modules).

Modules in a TeSys motor power-starter system with spring terminals

Motor power-starters can be connected to a PLC or a line in two ways:
- by direct connection from the control circuit splitter box 3, 4 starters, with one HE 10 connector (8I/8O) or two HE 10 connectors (16 I and 8 O).
- by a Tego Power module 1 using an **APP 2CX adapter plate** 2.

Tego Power communication modules for AS-Interface

AS-Interface module **APP 1CAS2** is an 8 input/8 output module for connection on AS-Interface (2 addresses).

■ **Notes on 8 input/8 output modules**

Module **APP 1CAS2** (AS-Interface 8I/8O) is fitted with a 4-switch system for making the following selections:
- switches C and D: option to feed back to the PLC data from either the circuit-breaker contact, or from the contactor on each of the 8 starters,
- switch E: an external input can be selected for each of the 4 end starters (nos. 5 to 8) if the starter is not being used,
- switch F: an external output can be selected for each of the 4 end starters (nos. 5 to 8) if the starter is not being used.

Characteristics

Type of module			APP 1CAS2
Ambient air temperature		**°C**	0…+ 55
Number of channels	Inputs		8
	Outputs		8
Supply			Via the AS-Interface cable, ⎓ 26.5 to 31.6 V
Indication			By LED, inputs/outputs and power ON
Current consumption on the line		**mA**	< 280 x 2
Inputs		**V**	24
		mA	5 per input
Outputs		**V**	24
		mA	50 per output (relay necessary)
AS-Interface profile			S.7.0 x 2
Connection to the sub-base			By 30-way, HE 10 connector
Connection of external I/O			–
Connection			By 2-way plug-in connector, at intervals of 5.08 mm

AS-Interface cabling system
Dedicated components
Tego Power communication module

APP 1CAS2

References

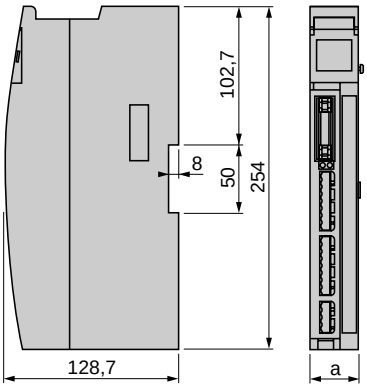
Description	Type of connection	Reference	Weight kg
Communication module	AS-Interface	**APP 1CAS2**	0.416

Accessories

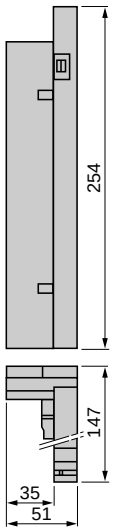
Description	Characteristics	Reference	Weight kg
Adapter	For AS-Interface module	**APP 2CX**	0.130
Insulation Displacement Connector (IDC) for AS-Interface	Yellow	**LA9 Z32825**	0.100

Dimensions

APP 1CAS2

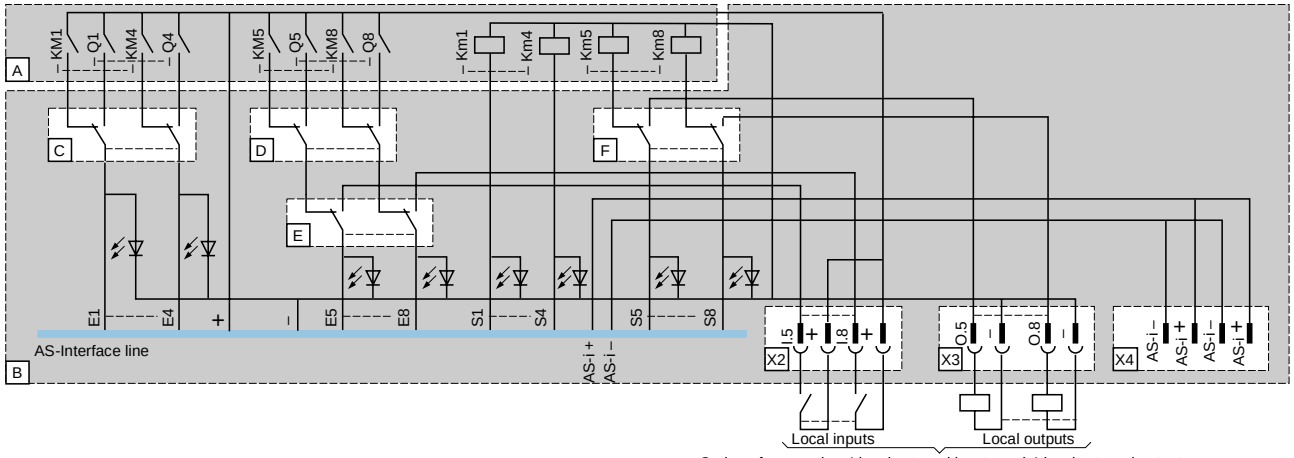


APP 2CX



Scheme and operating principle

Selection of local I/O by means of switches E and F and selection of contactor or circuit-breaker contact by means of switches C and D. With this module, information is fed back to the PLC via the AS-interface line.



Option of connecting 4 local external inputs and 4 local external outputs: selection via switches F and E.

A Tego Power sub-base.
B Communication module.
X2,X3 Removable terminal blocks, 8 pins, at intervals of 5.08 mm, for connecting 4 external inputs and 4 external outputs.
X4 Removable terminal blocks, 4 pins, at intervals of 5.08 mm, for the AS-Interface line (APP 1CAS2).
C,D Switches for selecting between feedback to the PLC from either the circuit-breaker or contactor status contact, for each of the 8 starters.
E Switch for each of the last 4 starters (5 to 8), for selecting between feedback to the PLC of the circuit-breaker or contactor status (result of switch D) or an external input (if the starter is not used).
F Switch for each of the last 4 starters (5 to 8), for selecting between controlling the contactor coil or an external output (if the starter is not used).

AS-Interface cabling system
Dedicated components
LA9 Z, AS-Interface V1
For D.O.L. starters

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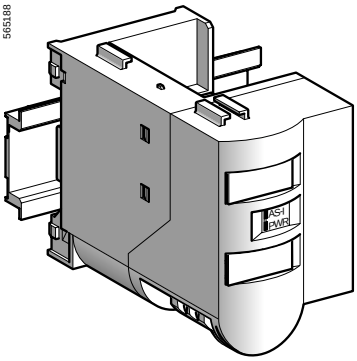

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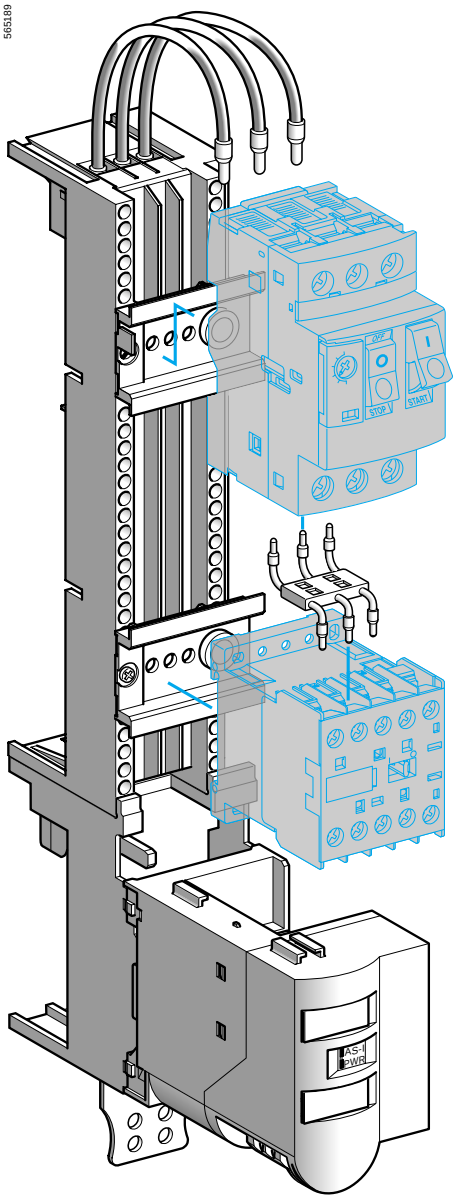

Presentation

AS-interface modules **LA9 Z32810** and **LA9 Z32811** allow motor starters to be monitored and controlled by AS-Interface. These products are in addition to the “AS-Interface enclosed starter” range, LF1 and LF2, LF7 and LF8.

The module sizes offered are: 2 inputs/1 output or 4 inputs/2 outputs.

These products can be mounted in two ways:

- on ⊓ rail,
- on **LA9 Z●●●** adapters for use with busbar systems.

Inputs/outputs are connected to a built-in, flexible terminal type connector, so reducing installation time.
The AS-Interface line is connected to the module by the yellow connector.
The external ⎓ 24 V supply to the module outputs is connected to the black connector. With this supply method, it is possible to make the output states subject to external safety conditions (Emergency stop, safety overtravel, etc.).

Characteristics : page 2/12
References : page 2/13
Dimensions, schemes : pages 2/14 and 2/15

AS-Interface cabling system

Dedicated components
LA9 Z, AS-Interface V1
For D.O.L. starters

Fields of application

The various module sizes allow control of:

- non-reversing starters,
- reversing starters,
- 2-speed starters for motors with separate windings.

The outputs, supplied by the separate auxiliary voltage, can simultaneously switch a current of 0.5 A at ⎓ 24 V and can therefore switch the following contactors:

- LP1, LP4 K06 ... K12,
- LC1 D09 to D32.

Composition

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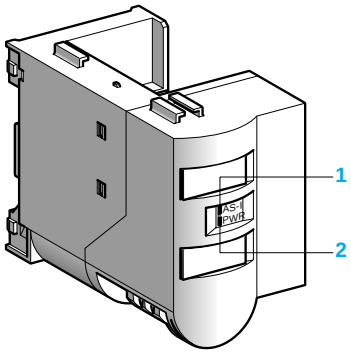

AS-Interface module

1 AS-Interface green/red LED indicator:
- red: no communication with the Master. The outputs are switched off,
- green: communication OK, outputs OK,
- red/yellow flashing: module has no address (assign an address between 1 and 31),
- off: no power supply to AS-Interface.

2 Green PWR LED:
- LED on: auxiliary power supply ON,
- LED off: auxiliary power supply OFF.

Characteristics : page 2/12
References : page 2/13
Dimensions, schemes : pages 2/14 and 2/15

AS-Interface cabling system

Dedicated components
LA9 Z, AS-Interface V1
For D.O.L. starters

General system environment

Interface type				LA9 Z32810		LA9 Z32811	
Product certifications				AS-Interface N° 18701		AS-Interface N° 18601	
Protective treatment				"TH"			
Degree of protection	Conforming to IEC 60539			IP 20			
Ambient air temperature around the device	Storage, conforming to IEC 60539		°C	- 40…+ 85			
	Operation		°C	- 10…+ 55			
Maximum operating altitude	Without derating		m	2000			
Flame resistance	Conforming to IEC 60695-2-1		°C	960			
Resistance to external mechanical impact	1/2 sine wave, 11ms conforming to IEC 60068-2-6			15 gn			
Vibration resistance	5…150 Hz conforming to 60068-2-6			2 gn			
Immunity to non-dissipating shockwave (Uimp)	Conforming to IEC 60439-1		kV	2.5: AS-Interface, 24 V and on inputs/outputs			
Immunity to electrostatic discharge	Conforming to IEC 61000-4-2 EN 61 000-4-2		kV	8: in open air (level 3) 4: in indirect mode (level 2)			
Immunity to fast transient currents	Conforming to IEC 61000-4-4 EN 61 000-4-4 level 4		kV	2: AS-Interface, 24 V and on inputs/outputs			
Immunity to dissipated shock wave	Conforming to IEC 61000-4-5 EN 61 000-4-5		kV	2: AS-Interface, 24 V and on inputs/outputs			
Immunity to conducted radio-frequency interference	Conforming to IEC 61000-4-6 ENV 50 141		V/m	10			
Immunity to radiated radio-frequency interference	Conforming to IEC 1000-4-3 ENV 50 140 and ENV 50 204 (GSM)		V/m	10			
Radio-conducted and radio-radiated rejection	ENV 55 011/CISPR (G1)			Class A			
AS-Interface supply			V	29.5-31.6			
Cabling c.s.a., AS-Interface	Flexible cable		mm^2	2 x 0.5…0.75			
Cabling c.s.a., 24 V	Flexible cable		mm^2	2 x 0.5…0.75			
Cabling c.s.a., input/output	Flexible cage terminal and flexible cable		mm^2	0.08…2.5; AWG28…12			
Input current			mA	7			
Coincidence of inputs				100 %			
Maximum length of wires to switching components			m	0.4			
Maximum current of outputs	⎓ 13/14, (24 V)		A	0.5			
Thermal current	Ith		A	2			
Coincidence of outputs				100 %			
Short-circuit protection	By flywheel diode			Yes			
Outputs switched off in event of interference on the AS-Interface line	Watchdog			Yes			
AS-Interface profile				3 F		7 F	
Number of I/O				2 inputs/1 output		4 inputs/2 outputs	
Current consumption	On AS-Interface On/OFF		mA	8…12		8…12	
Data bits		Status		0	1	0	1
	Command	D0 (O)	Out 1	Off	On	Off	On
		D1 (O)	Out 2	Not used		Off	On
		D2 (O)	Out 3	Not used			
		D3 (O)	Out 4	Not used			
	Status	D0 (I)	In 1	Absent	Present	Absent	Present
		D1 (I)	In 2	Absent	Present	Absent	Present
		D2 (I)	In 3	Not used		Absent	Present
		D3 (I)	In 4	Not used		Absent	Present
Parameters		P0…P3		Not used			

Presentation :
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page 2/13

Dimensions, schemes :
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AS-Interface cabling system

Dedicated components
LA9 Z, AS-Interface V1
For D.O.L. starters

AS-Interface modules *(1) (2)*

No. of channels	Number of inputs	Number of outputs	Output voltage	Current per output	Reference	Weight
			V	A		kg
3	2	1	⎓ 24	0.5	**LA9 Z32810**	0.070
6	4	2	⎓ 24	0.5	**LA9 Z32811**	0.070

Accessories

Description	Busbar system	Width	Reference	Weight
	mm	mm		kg
Modules without electrical connection, for use with all LA9 Z●● adapters	40 or 60	45	**LA9 Z32744**	0.044
		54	**LA9 Z32745**	0.051
Module with PE + N polarity and 5-way connector	40	45	**LA9 Z32740**	0.091
		54	**LA9 Z32741**	0.098
	60	45	**LA9 Z32742**	0.085
		54	**LA9 Z32743**	0.092

Replacement connectors and adapter cable

Description	Colour	Sold in lots of	Unit reference	Weight kg
Insulation Displacement Connector (IDC) for AS-Interface	Yellow	5	**LA9 Z32825**	0.100
Insulation Displacement Connector (IDC) for auxiliary supply	Black	5	**LA9 Z32826**	0.100

Description	Cable length	Reference	Weight
	m		kg
Adapter cable for connection to addressing terminal XZ MC11	0.5	**XZ MG12**	0.070

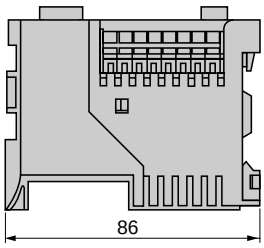
(1) User's Manual to be ordered separately, please consult your Regional Sales Office.
*(2) Supplied with connectors **LA9 Z32825** and **LA9 Z32826**.*

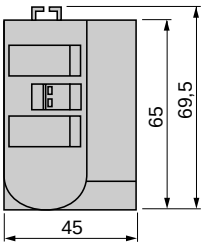
Presentation : pages 2/10 and 2/11
Characteristics : page 2/12
Dimensions, schemes : pages 2/14 and 2/15

AS-Interface cabling system
Dedicated components
LA9 Z, AS-Interface V1
For D.O.L. starters

Dimensions

LA9 Z3281●

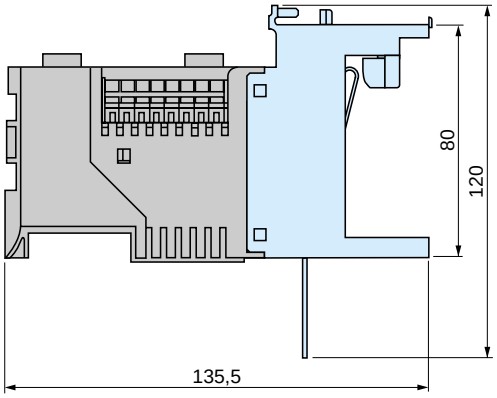




Mounting on modules

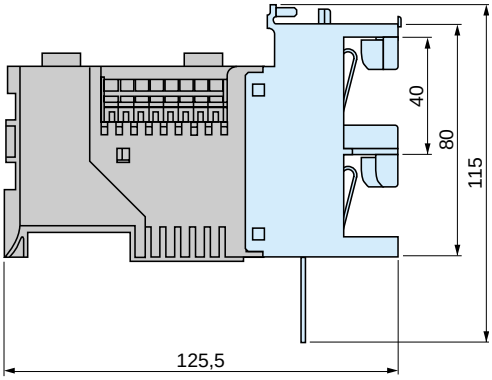
LA9 Z32742, LA9 Z32743

60 mm busbar system

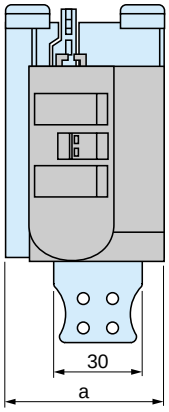


LA9 Z32740, LA9 Z32741

40 mm busbar system



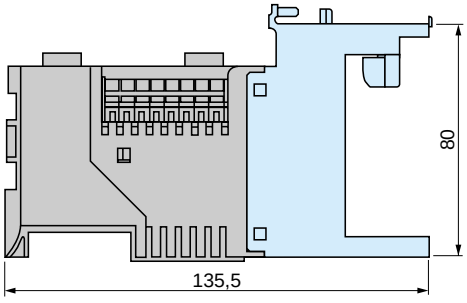
Common front face view



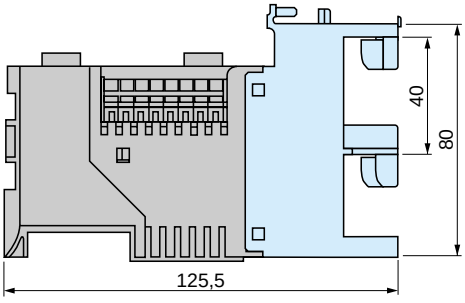
LA9	a
Z32740, Z32742	45
Z32741, Z32743	54

LA9 Z32745

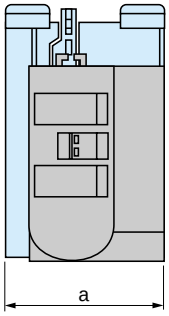
40 or 60 mm busbar system



LA9 Z32744



Common front face view



LA9	a
Z32745	54
Z32744	45

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Characteristics :
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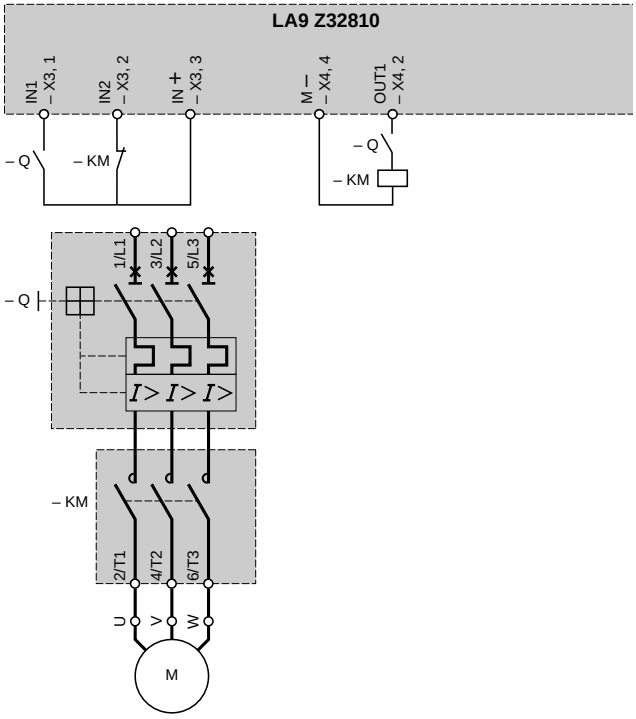
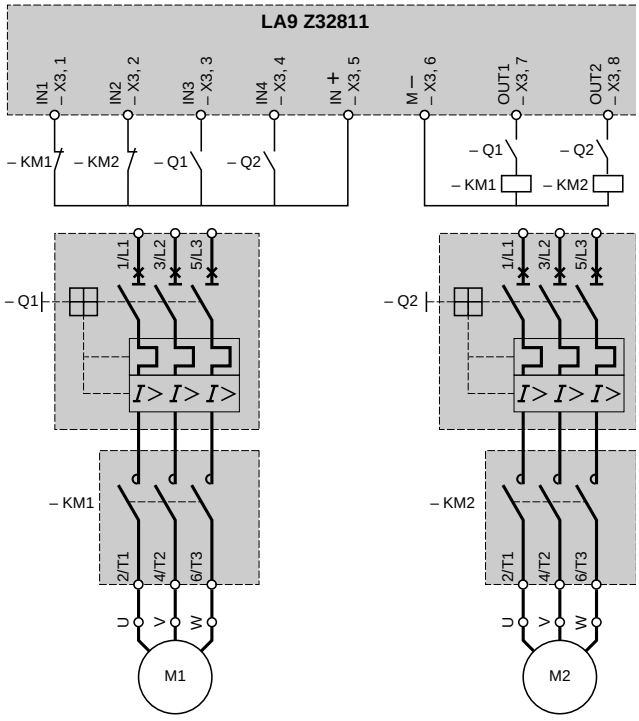
AS-Interface cabling system
Dedicated components
LA9 Z, AS-Interface V1
For D.O.L. starters

D.O.L. starter, non-reversing

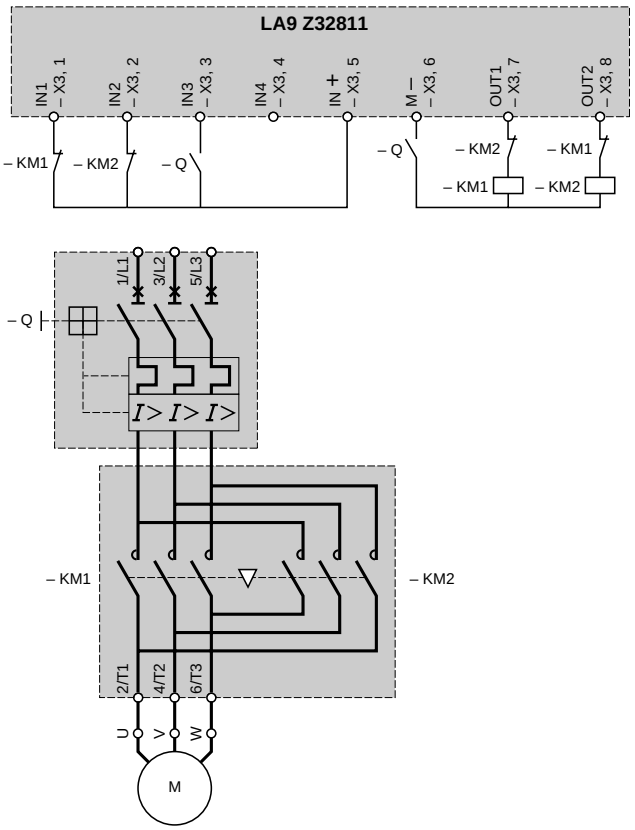
1 motor



2 motors



D.O.L. starter, reversing



Presentation : pages 2/10 and 2/11
Characteristics : page 2/12
References : page 2/13

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters

Presentation

LF7 and LF8 starters

These are the entry level models in our range of starters which communicate on the AS-Interface. These starters incorporate interface module LA9 Z32811 and are subdivided according to the different power connection methods (cable gland or Harting plug-in connectors) and Local/AS-Interface remote operating modes. These economical devices provide a simple and effective solution for building decentralised motor starters as near as possible to the motor.

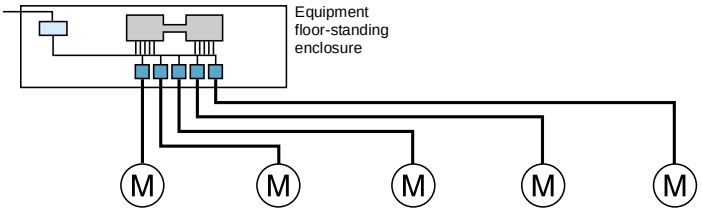
LF1 and LF2 starters

These complete, intelligent starters incorporate pre-programmed functions and a fault-management function. They are available in insulated or metal enclosures to suit different environments. When fitted with Harting plug-in connectors (variant A74), they drastically reduce setting-up times, thereby increasing the availability of machines.

Decentralisation of machine starters

These enclosed starters which communicate on AS-Interface are pre-assembled and ready-to-use with a minimum of cabling. They are designed for building decentralised electrical installations, i.e. the starters are installed as near as possible to the motors they are to control. The decentralisation of the starters provides obvious advantages regarding power distribution to machines not grouped together, for example: motors driving a conveyor system.

Traditional installation

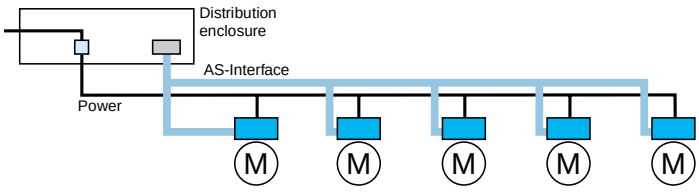


Distribution circuit circuit-breaker

Programmable controller with its inputs/outputs

Contactor + thermal overload relay

Decentralised installation



Distribution circuit circuit-breaker

Programmable controller

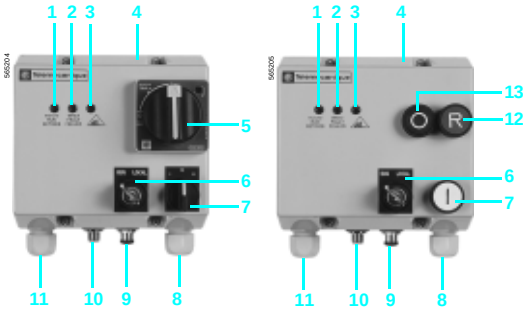
AS-Interface starter

Power is distributed either by prefabricated trunking or by cable.
These starters incorporate all the functions necessary for the management of motors (control, protection, isolation, etc.), and comprise:
- a thermal-magnetic circuit-breaker,
- a low consumption contactor (non reversing) or contactor pair (reversing),
- an electronic control device or, for LF7 and LF8, an AS-Interface module, LA9 Z32811.

Designed primarily for use with 3-phase a.c. motors, they can nevertheless be used with single-phase or d.c. motors. In these applications, the 3 phases of the internal circuit-breaker should be wired in series (each phase sensing the same current) in order to avoid tripping due to an assumed phase failure.

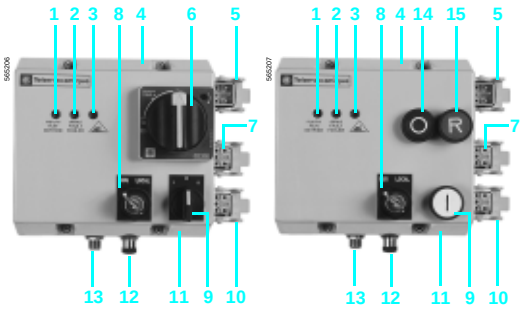
Characteristics : pages 2/22 to 2/25
References : pages 2/26 to 2/29
Dimensions, schemes : pages 2/34 to 2/41
Connections : pages 2/32 and 2/33

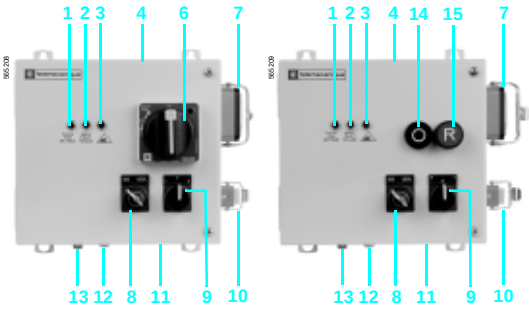
AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters



Connection by cable gland

1 Yellow LED, illuminated when motor running.
2 Red LED illuminated when there is a motor fault (overload or short-circuit) or an internal fault in the starter, or in the event of a communication fault.
3 Green LED illuminated (steady light) when the AS-Interface line is powered and flashing when information to the starter is being transmitted via the AS-Interface line.
4 Knock-out for cable gland (included for auxiliary supply, power extension or output control relay cabling, if required).
5 Disconnect rotary control knob.
Indicates “Trip” when switch-disconnector tripped.
6 Local/AS-Interface key switch (variant A79).
7 3-position, spring return to zero selector switch for reversing starter (LF2).
Function:
- position 1 = forward running,
- position 0 = Stop,
- position 2 = reverse running (variant A79).
Pushbutton for non-reversing starter (LF1) .
Function: Pulsed operation (variant A79).
8 Cable gland for power supply cable.
9 M12 female connector for cable connection to a sensor (supplied with protective cap) (variants A78 and A79).
10 M12 male connector for connection to AS-Interface *(1)* and auxiliary supply, if required.
11 Cable gland for motor cabling.
12 Reset pushbutton.
13 Stop pushbutton.





Connection by plug-in connectors (variant A74)

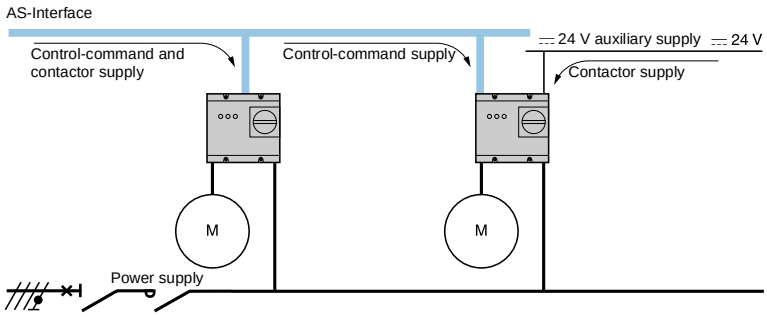
1 Yellow LED, illuminated when motor running.
2 Red LED illuminated when there is a motor fault (overload or short-circuit) or an internal fault in the starter, or in the event of a communication fault.
3 Green LED illuminated (steady light) when the AS-Interface line is powered and flashing when information to the starter is being transmitted via the AS-Interface line.
4 Knock-out for cable gland (included) for auxiliary supply cabling, if required.
5 Male connector for incoming power supply to motor starter *(2)*
6 Disconnect rotary control knob.
Indicates “Trip” when switch-disconnector tripped.
7 Female connector for power supply to the next motor starter *(2)*
8 Local/AS-Interface key switch (variant A79).
9 3-position, spring return to zero selector switch for reversing starter (LF2).
Function:
- position 1 = forward running,
- position 0 = Stop,
- position 2 = reverse running (variant A79).
Pushbutton: for non-reversing starters (LF1)
Function: Pulsed operation (variant A79).
10 Female connector for power supply to motor *(2)*.
11 Knock-out for cable gland (included) for output control relay.
12 M12 female connector for cable connection to a sensor (supplied with protective cap) (variants A78 and A79).
13 M12 male connector for connection to AS-Interface *(1)* and auxiliary supply, if required.
14 Stop pushbutton.
15 Reset pushbutton.

(1) Extension cables: please consult your Regional Sales Office.
(2) Harting plug-in connector to be fitted to cable (not included, see page 2/33).

Characteristics : pages 2/22 to 2/25
References : pages 2/26 to 2/29
Dimensions, schemes : pages 2/34 to 2/41
Connections : pages 2/32 and 2/33

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters

Auxiliary supply



LF1 and LF2 starters do not require an auxiliary supply to operate the contactors, since that provided by the AS-Interface line (yellow cable) is sufficient. Again, this reduces the cabling required.
However, depending on the application, it is possible to supply the contactor coils by an external ⎓ 24 V source. Selection is made by repositioning a jumper within the starter.

A ⎓ 24 V supply is necessary for LF7 and LF8 starters.

Prospective current consumptions are listed on page 2/25.

Motor command-control

The functions provided by this range of starters are:
- motor control and status monitoring via AS-Interface,
- D.O.L. starting (non-reversing or reversing),
- overload protection of the motor,
- short-circuit protection of the motor and its power supply cabling.

Starters with rotary control knob

These starters provide the following functions:
- load break switch-disconnector with padlockable control knob,
- IP 55 degree of protection, double insulation.

Opening of the enclosure is mechanically inhibited whilst the starter is switched on or whilst in the off position and padlocked.

The rotary control knob has 3 positions:
0: switch-disconnector opened manually,
I: switch-disconnector closed,
Trip: switch-disconnector tripped.

Starters with pushbutton control

These starters provide the following functions:
- pushbutton resetting of the protection device,
- pushbutton stop,
- IP 65 degree of protection, double insulation.

Characteristics : pages 2/22 to 2/25
References : pages 2/26 to 2/29
Dimensions, schemes : pages 2/34 to 2/41
Connections : pages 2/32 and 2/33

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters

Local control

Stop and reset functions are possible from the front of the enclosure. The stop command is achieved by actuating the internal circuit-breaker, which provides the switch-disconnector function.

Depending on the type of starter, stopping is controlled by either:
- a rotary control knob, or
- a stop pushbutton (black) *(1)*.

In the event of an overload, resetting of the internal thermal-magnetic circuit-breaker is possible after the motor has cooled down.

Depending on the type of starter, resetting is controlled by either:
- a rotary control knob, or
- a reset pushbutton (blue) *(1)*.

Integral local/AS-Interface control (variant A79)

This starter variant is fitted with a 2-position “local/AS-Interface” switch which, depending on the position of the switch, allows the following functions:

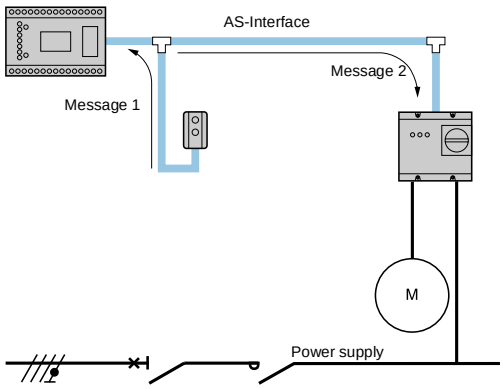
■ AS-Interface: the PLC controls the motor starter.

■ Local: local Start/Stop commands override instructions from the PLC.

■ 3-position, spring return to zero selector switch for reversing starters (LF2, LF8). Function:
- position 1 = forward running,
- position 0 = Stop,
- position 2 = reverse running.

Pushbutton for non-reversing starters (LF1, LF7). Function: Pulsed operation.

Control via a control station



It is possible to achieve manual local start control from a pushbutton control station connected to AS-Interface. Please consult your Regional Sales Office.

Actuation of the pushbutton is transmitted to the programmable controller (message 1) which passes it on to the starter (message 2).

(1) Only a rotary control knob is available for starters LF7 and LF8.

Characteristics : pages 2/22 to 2/25
References : pages 2/26 to 2/29
Dimensions, schemes : pages 2/34 to 2/41
Connections : pages 2/32 and 2/33

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters

Local signalling
Visual indication of the various operating states is provided by LEDs (3 LEDs for LF1/LF2 and 1 LED for LF7/LF8) located on the enclosure cover.

Safety
The starter features continual self-checking to ensure correct operation.

External safety functions are not processed by the starter.

Emergency stop and machine safety wiring must follow standard safety practice and be hard-wired, using electromechanical devices in the approved way. These functions must not be handled by communication bus systems (EN 60204 § 9.2.5.4).

Protection against sudden restarting, after an accidental power supply failure, must be provided by a safety device separate from the starter.

The starter control (rotary knob or pushbutton) does not provide the Emergency Stop function if the machine is fitted with other actuators. The control operators on the starter are therefore coloured black, in accordance with standard EN 60204 § 10.2.1.

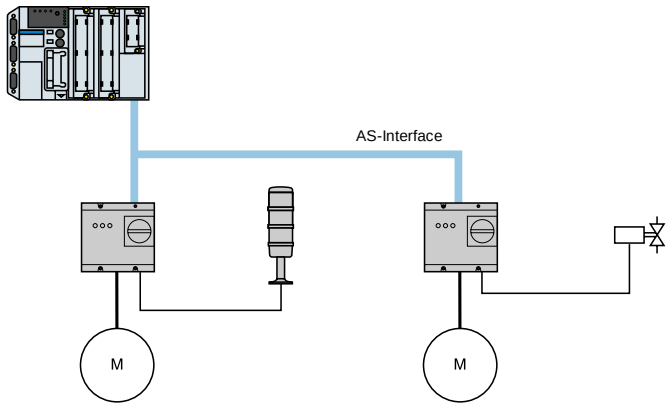
Starters with rotary control knob may be padlocked in the ON position, since this control does not provide an Emergency Stop function.

Loss of control (LF1, LF2 only)
When communication is interrupted, the starter is no longer controlled by the PLC. In this case, it can be configured to adopt the following fallback conditions:
- motor set to stop (applications: potentially dangerous movements),
- motor set to run in direction 1 (forward) (applications: fans, pumps),
- or motor continues to run as it was immediately prior to loss of control (application: suction grippers).

The fallback configuration is set via AS-Interface.

The default configuration is with the motor set to stop.

Output control relay (LF1, LF2 only)
This relay incorporates a C/O contact, which may be used to control an indicator lamp, solenoid valve, etc. (24 V, 1 A), via AS-Interface.



AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters

Starters with sensor connected

Two 3-wire PNP sensors (50 mA max) or 2-wire limit switches can be connected directly to the starter.
The information supplied by the sensor/limit switch is fed back via AS-Interface.

In addition, for LF1 and LF2 starters only, the sensor signal can be processed locally to achieve a Reflex motor stop. This function is selected by means of micro switches. 127 other selections are reserved for future applications.

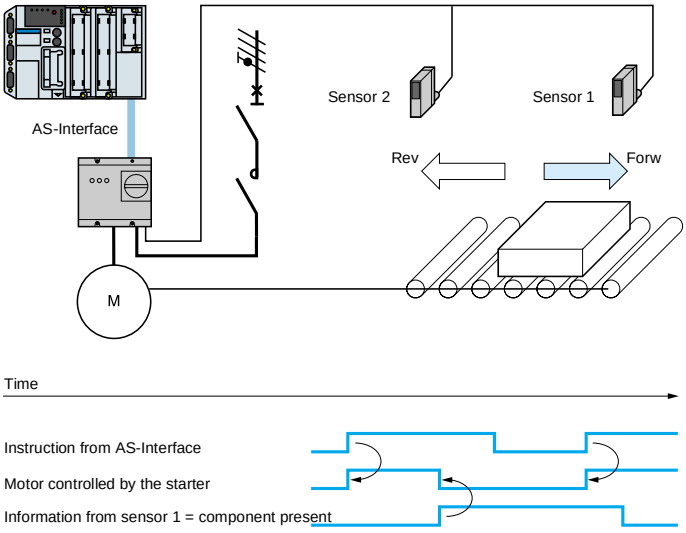
Reflex stop (LF1, LF2 only)

There are two types of “Reflex stop” function:

■ “Reflex stop” function n° 1
Sensor n° 1 directly controls stopping of the motor.
After a new start instruction, the motor restarts (stop instruction then start instruction).

A Reflex stop makes it possible to achieve precise and repetitive positioning, independently of the AS-Interface and PLC cycle times.

For reversing starters, sensor n° 1 acts on both running directions.
Sensor n° 2 does not affect Reflex operation.



■ “Reflex stop” function n° 2
Sensor n° 1 controls stopping of the motor when it is running in the forward direction.
Sensor n° 2 controls stopping of the motor when it is running in reverse direction.

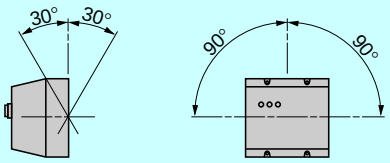
A new start instruction (stop instruction then start instruction) causes restarting of the motor even if a component is still detected.

Sensor n° 2 does not affect forward running. Sensor n° 1 does not affect reverse running.

Characteristics : pages 2/22 to 2/25
References : pages 2/26 to 2/29
Dimensions, schemes : pages 2/34 to 2/41
Connections : pages 2/32 and 2/33

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters

Environment

Starter type			LF1, LF2	LF7, LF8
Conforming to standards			IEC 60204-1, EN 60204-1, IEC 60439-1, IEC 60947-4-1, EN 60947-4-1 UL 508, CSA C22-2 n° 14 *(1)*	–
Product certifications			AS-Interface pending	AS-Interface N° 18601
Protective treatment	Standard version		"TC"	"TH"
Degree of protection conforming to IEC 60529	Starters with rotary control knob		IP 55	IP 55
	Starters with pushbutton control		IP 65	–
Ambient air temperature around the device conforming to IEC 60439-1	Storage	**°C**	- 40…+ 80	- 40…+ 85
	Operation	**°C**	- 5…+ 40	- 10…+ 40
Maximum operating altitude	Without derating	**m**	2000	
Operating positions without derating	In relation to normal vertical mounting plane			
Flame resistance of equipment	Conforming to IEC 60695-2-1	**°C**	960	
Shock resistance (1/2 sine wave, 11 ms) conforming to IEC 60068-2-27	Contactor open		10 gn	
	Contactor closed		15 gn	
Vibration resistance 5…150 Hz conforming to IEC 60068-2-6	Contactor open		2 gn	
	Contactor closed		4 gn	
Safe separation of circuits	Conforming to VDE 0106 and IEC 60536		SELV (Safety Extra Low Voltage), up to 400 V	
Immunity to non-dissipating shockwave (Uimp)	Conforming to IEC 60947-1	**kV**	6: power 2.5: AS-Interface, 24 V and sensor	6: power 2: AS-Interface, 24 V and sensor
Material and colour of enclosure base	Insulated enclosures		Polycarbonate impregnated with 20 % glass fibre, black throughout	
	Metal enclosures		Sheet steel, RAL 7032	–
Material and colour of enclosure cover	Insulated enclosures		Polycarbonate impregnated with 20% glass fibre, grey RAL 7032 throughout	
	Metal enclosures		Sheet steel, RAL 7032	–
Resistance to chemical agents	Insulated enclosures		Avoid allowing this material to come into contact with: strong bases (certain detergents), aromatic hydrocarbons, alcohol, chlorine solvents, ketones.	

Electromagnetic compatibility

Immunity to electrostatic discharge	Conforming to IEC 61000-4-2 EN 61000-4-2	**kV**	8: in open air (level 3) 4: in indirect mode (level 2)	
Immunity to fast transient currents	Conforming to IEC 61000-4-4 EN 61000-4-4	**kV**	2: power, AS-Interface, 24 V and sensor (level 3)	2: AS-Interface, 24 V and on inputs/outputs
Immunity to dissipated shock wave	Conforming to IEC 61000-4-5 EN 61000-4-5	**kV**	4/2: power (level 4) 2/0.5: AS-Interface, 24 V and sensor (level 2)	2: AS-Interface, 24 V and on inputs/outputs
Immunity to conducted radio-frequency disturbance	Conforming to IEC 61000-4-6 ENV 50 141	**V/m**	10	
Immunity to radiated radio-frequency disturbance	Conforming to IEC 61000-4-3 ENV 50 140 and ENV 50 204 (GSM)	**V/m**	10	
Radio-conducted and radio-radiated rejection	ENV 55 011/CISPR11 (G1)		Class B	Class A

*(1) Only for metal enclosures with letter **U** at the end of the reference.*

Functions : pages 2/18 to 2/21
References : pages 2/26 to 2/29
Dimensions, schemes : pages 2/34 to 2/41
Connections : pages 2/32 and 2/33

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters

Connection

Starter type				LF1, LF7		LF2, LF8	
				Min.	Max.	Min.	Max.
Power supply cabling	Screw clamp terminals	Solid cable	**mm²**	1 x 1.5	2 x 6	1 x 1.5	2 x 6
		Flexible cable without cable end	**mm²**	1 x 1.5	2 x 6	1 x 1.5	2 x 6
		Flexible cable with cable end	**mm²**	1 x 1.5	2 x 4	1 x 1.5	2 x 4
		Tightening torque *(1)*	**N.m**	1.7	1.7	1.7	1.7
	Cable gland (Pg 16)	Clamping capacity	**mm**	10	15	10	15
				Min.	Max.	Min.	Max.
Motor cabling	Screw clamp terminals	Solid cable	**mm²**	1 x 1.5	2 x 4	1 x 1.5	1 x 4
		Flexible cable without cable end	**mm²**	1 x 1.5	2 x 4	1 x 1.5	1 x 4
		Flexible cable with cable end	**mm²**	1 x 1.5	1 x 1.5 + 1 x 2.5	1 x 1.5	1 x 2.5
		Tightening torque *(1)*	**N.m**	0.8	0.8	0.8	0.8
	Cable gland (Pg 16)	Clamping capacity	**mm**	10	15	10	15
				Min.	Max.	Min.	Max.
Auxiliary 24 V supply and output control relay cabling	Terminal block	Solid cable	**mm²**	0.5	1.5	0.5	1.5
		Flexible cable without cable end	**mm²**	0.5	1.5	0.5	1.5
		Flexible cable with cable end	**mm²**	0.5	1.5	0.5	1.5
		Tightening torque *(2)*	**N.m**	0.7	0.7	0.7	0.7
	Cable gland (included)	Clamping capacity Pg 13	**mm**	8	13	8	13
		Pg 16	**mm**	10	15	10	15

Pole electrical characteristics

Utilisation category	Conforming to IEC 60947-2 (circuit-breaker)			A
	Conforming to 947-4-1 (motor starter)			AC-3
Rated operational voltage (Ue)	Conforming to IEC 60947		**V**	415
Rated insulation voltage (Ui)	Conforming to IEC 60947		**V**	415
Rated operational frequency	Conforming to IEC 60947		**Hz**	50/60
Breaking capacity (Ics and Icu)	Conforming to IEC 60947-2	230/240 V	**kA**	> 100
		400/415 V	**kA**	> 100
Sensitivity to phase failure	Conforming to IEC 60947-4-1 § 7-2-1-5-2			Yes

Circuit-breaker characteristics (manual operation)

Mechanical durability	C.O.: closing, opening	**C.O.**	100 000
Electrical durability	In category AC-3	**C.O.**	100 000
Service class	Maximum operating rate	**C.O./h**	25

Circuit-breaker characteristics (automatic operation)

Maximum operating rate	In operating cycles per hour		3600	
Mechanical durability	In millions of operating cycles		30	5
Electrical durability	In category AC-3 to 8.5 A		800 000	

Other characteristics

Starters with rotary control knob	Circuit-breaker type **GV2 P**		See our catalogue "Motor starter solutions"
Starters with pushbutton control	Circuit-breaker type **GV2 ME - LF1, LF2** only		See our catalogue "Motor starter solutions"
Non-reversing starters	Contactor **LP4 K09015BW3**		See our catalogue "Motor starter solutions"
Reversing starters	Reversing contactor **LP5 K09015BW3**		See our catalogue "Motor starter solutions"

(1) Philips n° 2 or flat screwdriver Ø 5.5.
(2) Flat screwdriver Ø 3.5.

Functions : pages 2/18 to 2/21
References : pages 2/26 to 2/29
Dimensions, schemes : pages 2/34 to 2/41
Connections : pages 2/32 and 2/33

2

Sensor inputs

Starter type				LF1, LF2 (A78 and A79)	LF7, LF8 (A78)
Connection				M12	M12
Nominal input values	Voltage		**V**	⎓ 24	⎓ 24
	Maximum current available per sensor		**mA**	50	7
	Sensor supply (including ripple)		**V**	19…30	–
Input value limits	At state 1	Voltage	**V**	⎓ >12.6	–
		Current	**mA**	> 4.9	–
	At state 0	Voltage	**V**	⎓ <5	–
		Current	**mA**	< 2.1	–
Input impedance			**kΩ**	> 2	–
Filtering time	Typical		**ms**	7	–
	Maximum		**ms**	9.8	–
Maximum number of sensors				2	2
Proximity sensor compatibility				2-wire/3-wire	2-wire
Isolation with respect to the AS-Interface line				None	–
Input type				Resistive for PNP type sensor	–

Output control relay (for starters LF1 and LF2 with variants A78 and A79)

Operating voltage limit	a.c. supply		**V**	24
	d.c. supply		**V**	24
Thermal current at 40 °C (Ith)			**A**	5
Service life on an ∿ 24 V load	Resistive load AC-12	Millions of operating cycles		0.1 *(1)* in 5 A current, 1 *(2)* in 1 A current.
	Inductive load AC-14	Millions of operating cycles		0.5 *(2)* in 1 A current, 1 *(2)* in 0.5 A current, 5 *(3)* in 0.25 A current.
Service life on a ⎓ 24 V load	Resistive load DC-12	Millions of operating cycles		0.1 *(1)* in 5 A current, 0.2 *(1)* in 2 A current.
	Resistive load DC-3	Millions of operating cycles		0.5 *(2)* in 1 A current, > 1 *(3)* in 0.25 A current.
Response time		Latching	**ms**	< 10
		Unlatching	**ms**	< 10
Contact type				C/O
Built-in protection		Against overloads and short-circuits		None, a quick-blow fuse must be fitted
		Against a.c. or d.c. inductive overloads		Protected against overvoltages generated by switching the coils of preactuators
Isolation		rms voltage between output and earth or between output and internal logic	**V**	1500, 50/60 Hz for 60 s
		Insulation resistance between output terminals and AS-Interface	**mΩ**	> 1000

(1) 0.2 of an operation (C/O) per second.
(2) 0.5 of an operation (C/O) per second.
(3) 1 operation (C/O) per second.

Functions : pages 2/18 to 2/21
References : pages 2/26 to 2/29
Dimensions, schemes : pages 2/34 to 2/41
Connections : pages 2/32 and 2/33

Consumption

Starter type			Product configured for supply from the AS-Interface line		Product configured for supply from an auxiliary ⎓ 24 V supply			
			LF1	LF2	LF1	LF2	LF7	LF8
Current consumption	From the AS-Interface line	De-energised	80 mA	90 mA	80 mA	90 mA	8 mA	8 mA
		Inrush	190 mA	200 mA	80 mA	90 mA	–	–
		Sealed	110 mA	120 mA	80 mA	90 mA	12 mA	12 mA
		With sensor	Sensor consumption (50 mA max) + 15 mA (signal = 1)					
		Relay	25 mA					
	From the auxiliary ⎓ 24 V supply	De-energised	–	–	0	0	0	0
		Inrush	–	–	110 mA	110 mA	750 mA	750 mA
		Energised	–	–	30 mA	30 mA	750 mA	750 mA

Data exchange characteristics

AS-Interface profile		7.D *(3)*		7F	
Data bits (commands)	Bit value	**= 0**	**= 1**	For commands, please refer to the LF7 and LF8 starter schemes on page 2/38.	
	Command D0 (O)	Stop - forward running	Start - forward running		
	Command D1 (O)	Stop - reverse running	Start - reverse running *(2)*		
	Command D2 (O)	Deactivation of control relay	Activation of control relay		
	Command D3 (O)	Not Used	Not Used		
Data bits (status)	Bit value	**= 0**	**= 1**	For states, please refer to the LF7 and LF8 starter schemes on page 2/38.	
	Status D0 (I)	Not ready or fault	Ready		
	Status D1 (I)	Stopped	Running		
	Status D2 (I)	Sensor 1 signal absent *(1)*	Sensor 1 signal present *(1)*		
	Status D3 (I)	Sensor 2 signal absent *(1)*	Sensor 2 signal present *(1)*		
Parameter bits	Bit value	**= 0**	**= 1** (default value)	–	
	Parameter P0	Maintain operational state	Assume fallback condition	Not used	
	Parameter P1	Fallback condition - Start	Fallback condition - Stop	Not used	
	Parameter P2	Not used	Not used	Not used	
	Parameter P3	Reflex function inhibited	Reflex function enabled	Not used	

(1) Only applicable to starters with sensors (variants A78 and A79).
(2) Only on LF2 or LF8.
(3) Please consult the user's guide supplied with the product.

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters
Models LF1 P and LF2 P

Characteristics

Conforming to standards		IEC 60204-1, 60439-1, 60947-4-1, EN 60204-1, 60947-4-1 UL 508, CSA C22-2 n° 14 *(1)*
Degree of protection	Conforming to IEC 60529	IP 55
Ambient air temperature	Operation	- 5 to + 40 °C
Operating positions		Same as for the contactors
Material		**LF● P**: polycarbonate *(2)*. **LF● MP**: sheet steel

Starters in insulated enclosures

11427

LF1 P●●D

11427

LF1 P●●DA78

11432

LF2 P●●DA79A74

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3		Circuit-breaker adjustment range of thermal trips	Starter	
			Reference	Weight
220/230 V	400/415 V			
kW	kW	A		kg
Non-reversing starters with rotary control knob, with blue handle on black background *(3)*				
–	–	Without	**LF1 P00D** *(4)*	1.020
–	0.06	0.16…0.25	**LF1 P02D**	1.300
0.06	0.09	0.25…0.40	**LF1 P03D**	1.300
– –	0.12 0.18	0.40…0.63	**LF1 P04D**	1.300
0.09 0.12	0.25 –	0.63…1	**LF1 P05D**	1.300
0.18 0.25	0.37 0.55	1…1.6	**LF1 P06D**	1.350
0.37	0.75	1.6…2.5	**LF1 P07D**	1.350
0.55 0.75	1.1 1.5	2.5…4	**LF1 P08D**	1.350
1.1	2.2	4…6.3	**LF1 P10D**	1.350
1.5 –	3 4	6…10	**LF1 P14D**	1.350
2.2 3	5.5 –	9…14	**LF1 P16D**	1.350
Reversing starters with rotary control knob, with blue handle on black background *(3)*				
–	–	Without	**LF2 P00D** *(4)*	1.020
–	0.06	0.16…0.25	**LF2 P02D**	1.550
0.06	0.09	0.25…0.40	**LF2 P03D**	1.550
– –	0.12 0.18	0.40…0.63	**LF2 P04D**	1.550
0.09 0.12	0.25 –	0.63…1	**LF2 P05D**	1.550
0.18 0.25	0.37 0.55	1…1.6	**LF2 P06D**	1.600
0.37	0.75	1.6…2.5	**LF2 P07D**	1.600
0.55 0.75	1.1 1.5	2.5…4	**LF2 P08D**	1.600
1.1	2.2	4…6.3	**LF2 P10D**	1.600
1.5 –	3 4	6…10	**LF2 P14D**	1.600
2.2 3	5.5 –	9…14	**LF2 P16D**	1.600

Starters in metal enclosures

Add the letter **M** after LF1 or LF2 in the references selected above. Example: LF1 P02D becomes **LF1 MP02D**.
To order a starter that conforms to standards UL 508 and CSA C22-2 n° 14, add a letter **M** after LF1 or LF2 and the letter **U** at the end of the references selected above. Example: LF1 P02D becomes **LF1 MP02DU**.
Metal enclosures are fitted, as standard, with connections for 2 sensors.

Variants (pre-assembled)

11431

LF2 MP●●DA74A79

Description	For mounting on	Suffix to be added to the starter reference *(5)*
With HARTING connectors *(6)*	Insulated or metal enclosure	**A74**
With connections for 2 sensors	Insulated enclosure	**A78**
With connections for 2 sensors and local/AS-Interface control	Insulated enclosure	**A79**
With local/AS-Interface control	Metal enclosure	**A79**

*(1) Only for metal enclosures with letter **U** at the end of the reference.*
(2) Avoid allowing the material to come into contact with strong bases (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
*(3) On metal enclosures only, to order an Emergency Stop rotary control knob with red handle on yellow background, add the letter **R** to the end of the reference. Example: **LF1 MP02DR**.*
(4) Supplied without circuit-breaker GV2 P.
*(5) Example: **LF1 P02DA79A74**.*
(6) Connectors to be fitted to cables (to be ordered separately, see page 2/33).

Dimensions :
pages 2/34 to 2/37

Schemes :
pages 2/39 and 2/41

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters
Models LF1 M and LF2 M

Characteristics

Conforming to standards		IEC 60204-1, 60439-1, 60947-4-1, EN 60204-1, 60947-4-1 UL 508, CSA C22-2 n° 14 *(1)*
Degree of protection Conforming to IEC 60529	Insulated enclosure	IP 65
	Metal enclosure	IP 55
Ambient air temperature	Operation	- 5 to + 40 °C
Operating positions		Same as for the contactors
Material		**LF● M**: polycarbonate *(2)*. **LF● MM**: sheet steel

Starters in insulated enclosures

11429

LF1 M●●D

11426

LF1 M●●DA78

11425

LF1 M●●DA79

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3		Circuit-breaker Adjustment range of thermal trips	Starter	
			Reference	Weight
220/230 V	400/415 V			
kW	kW	A		kg
Non-reversing starters with pushbutton control				
–	–	Without	**LF1 M00D** *(3)*	1.000
–	0.06	0.16…0.25	**LF1 M02D**	1.250
0.06	0.09	0.25…0.40	**LF1 M03D**	1.250
– –	0.12 0.18	0.40…0.63	**LF1 M04D**	1.250
0.09 0.12	0.25 –	0.63…1	**LF1 M05D**	1.250
0.18 0.25	0.37 0.55	1…1.6	**LF1 M06D**	1.300
0.37	0.75	1.6…2.5	**LF1 M07D**	1.300
0.55 0.75	1.1 1.5	2.5…4	**LF1 M08D**	1.300
1.1	2.2	4…6.3	**LF1 M10D**	1.300
1.5 –	3 4	6…10	**LF1 M14D**	1.300
2.2 3	5.5 –	9…14	**LF1 M16D**	1.300
Reversing starters with pushbutton control				
–	–	Without	**LF2 M00D** *(3)*	1.000
–	0.06	0.16…0.25	**LF2 M02D**	1.500
0.06	0.09	0.25…0.40	**LF2 M03D**	1.500
– –	0.12 0.18	0.40…0.63	**LF2 M04D**	1.500
0.09 0.12	0.25 –	0.63…1	**LF2 M05D**	1.500
0.18 0.25	0.37 0.55	1…1.6	**LF2 M06D**	1.550
0.37	0.75	1.6…2.5	**LF2 M07D**	1.550
0.55 0.75	1.1 1.5	2.5…4	**LF2 M08D**	1.550
1.1	2.2	4…6.3	**LF2 M10D**	1.550
1.5 –	3 4	6…10	**LF2 M14D**	1.550
2.2 3	5.5 –	9…14	**LF2 M16D**	1.550

Starters in metal enclosures

Add the letter **M** after LF1 or LF2 in the references selected above. Example: LF1 M02D becomes **LF1 MM02D**.
To order a starter that conforms to standards UL 508 and CSA C22-2 n° 14, add a letter **M** after LF1 or LF2 and the letter **U** at the end of the references selected above. Example: LF1 M02D becomes **LF1 MM02DU**.
Metal enclosures are fitted, as standard, with connections for 2 sensors.

Variants (pre-assembled)

11432

LF2 MM●●DA79A74

Description	For mounting on	Suffix to be added to the starter reference *(4)*
With HARTING connectors *(5)*	Insulated or metal enclosure	**A74**
With connections for 2 sensors	Insulated enclosure	**A78**
With connections for 2 sensors and local/AS-Interface control	Insulated enclosure	**A79**
With local/AS-Interface control	Metal enclosure	**A79**

*(1) Only for metal enclosures with letter **U** at the end of the reference.*
(2) Avoid allowing the material to come into contact with strong bases (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(3) Supplied without GV2 ME motor circuit-breaker.
*(4) Example: **LF1 M02DA79A74**.*
(5) Connectors to be fitted to cables (to be ordered separately, see page 2/33).

Dimensions :
pages 2/34 to 2/37

Schemes :
pages 2/39 and 2/41

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters
Model LF7 P

Characteristics

Conforming to standards		–
Degree of protection	Conforming to IEC 60529	IP 55
Ambient air temperature	Operation	- 10 to + 40 °C
Operating positions		Same as for the contactors
Material		Polycarbonate *(1)*

Starters in insulated enclosures

LF7 P●●D

LF7 P●●DA74

Non-reversing starters with rotary control knob, with red handle on yellow background

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3		Circuit-breaker Adjustment range of thermal trips	Starter	
220/230 V	400/415 V		Reference	Weight
kW	kW	A		kg
–	–	Without	**LF7 P00D** *(2)*	1.020
–	0.06	0.16…0.25	**LF7 P02D**	1.300
0.06	0.09	0.25…0.40	**LF7 P03D**	1.300
– –	0.12 0.18	0.40…0.63	**LF7 P04D**	1.300
0.09 0.12	0.25 –	0.63…1	**LF7 P05D**	1.300
0.18 0.25	0.37 0.55	1…1.6	**LF7 P06D**	1.350
0.37	0.75	1.6…2.5	**LF7 P07D**	1.350
0.55 0.75	1.1 1.5	2.5…4	**LF7 P08D**	1.350
1.1	2.2	4…6.3	**LF7 P10D**	1.350
1.5 –	3 4	6…10	**LF7 P14D**	1.350
2.2 3	5.5 –	9…14	**LF7 P16D**	1.350

Variants (pre-assembled)

Description	Suffix to be added to the starter reference *(3)*
With HARTING connectors *(4)*	**A74**
With local/AS-Interface control *(5)*	**A79**

(1) Avoid allowing the material to come into contact with strong bases (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(2) Supplied without GV2 P motor circuit-breaker.
*(3) Example: **LF1 P02DA79A74**.*
(4) Connectors to be fitted to cables (to be ordered separately, see page 2/33).
(5) LF7 enclosures are fitted, as standard, with connections for 2 sensors (2-wire only).

Dimensions :
pages 2/34 and 2/35

Schemes :
pages 2/38 to 2/41

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters
Model LF8 P

Characteristics

Conforming to standards		–
Degree of protection	Conforming to IEC 60529	IP 55
Ambient air temperature	Operation	- 10 to + 40 °C
Operating positions		Same as for the contactors
Material		Polycarbonate *(1)*

Starters in insulated enclosures

11637

LF8 P●●DA78

11633

LF2 P●●DA78A74

Reversing starters with rotary control knob, with red handle on yellow background

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3		Circuit-breaker Adjustment range of thermal trips	Starter	
			Reference	Weight
220/230 V	400/415 V			
kW	kW	A		kg
–	–	Without	**LF8 P00D** *(2)*	1.020
–	0.06	0.16…0.25	**LF8 P02D**	1.550
0.06	0.09	0.25…0.40	**LF8 P03D**	1.550
– –	0.12 0.18	0.40…0.63	**LF8 P04D**	1.550
0.09 0.12	0.25 –	0.63…1	**LF8 P05D**	1.550
0.18 0.25	0.37 0.55	1…1.6	**LF8 P06D**	1.600
0.37	0.75	1.6…2.5	**LF8 P07D**	1.600
0.55 0.75	1.1 1.5	2.5…4	**LF8 P08D**	1.600
1.1	2.2	4…6.3	**LF8 P10D**	1.600
1.5 –	3 4	6…10	**LF8 P14D**	1.600
2.2 3	5.5 –	9…14	**LF8 P16D**	1.600

Variants (pre-assembled)

Description	Suffix to be added to the starter reference *(3)*
With HARTING connectors *(4)*	**A74**
With connection for 2 sensors (2-wire only)	**A78**
With local/AS-Interface control	**A79**

(1) Avoid allowing the material to come into contact with strong bases (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
(2) Supplied without GV2 P motor circuit-breaker.
*(3) Example: **LF8 P02DA79A74**.*
(4) Connectors to be fitted to cables (to be ordered separately, see page 2/33).

Dimensions :
pages 2/34 and 2/35

Schemes :
pages 2/38 to 2/41

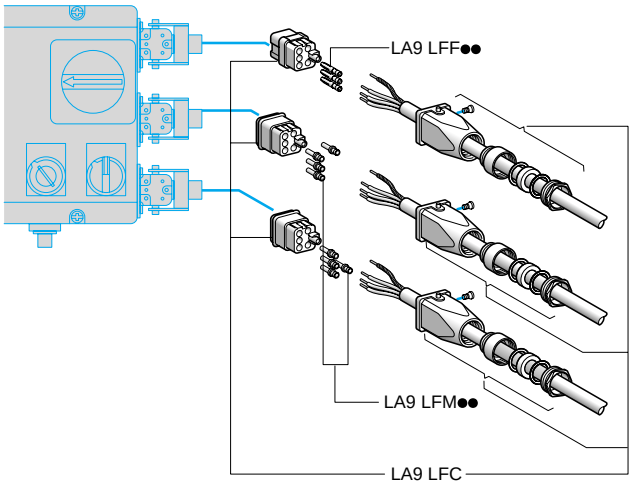
AS-Interface cabling system

Dedicated components

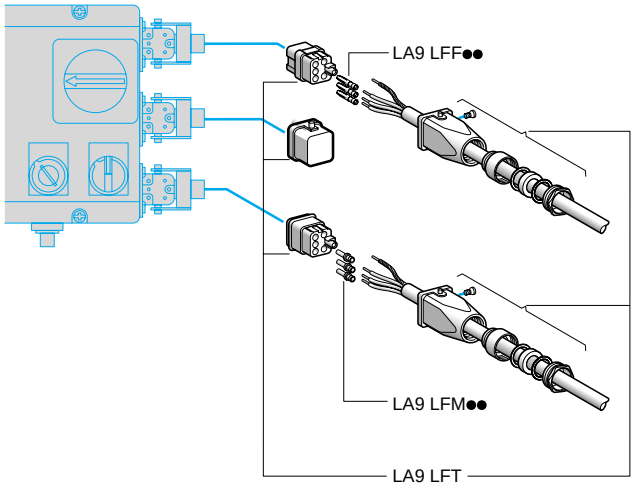
Enclosed D.O.L. starters

Insulated enclosures LF1, LF2, LF7, LF8

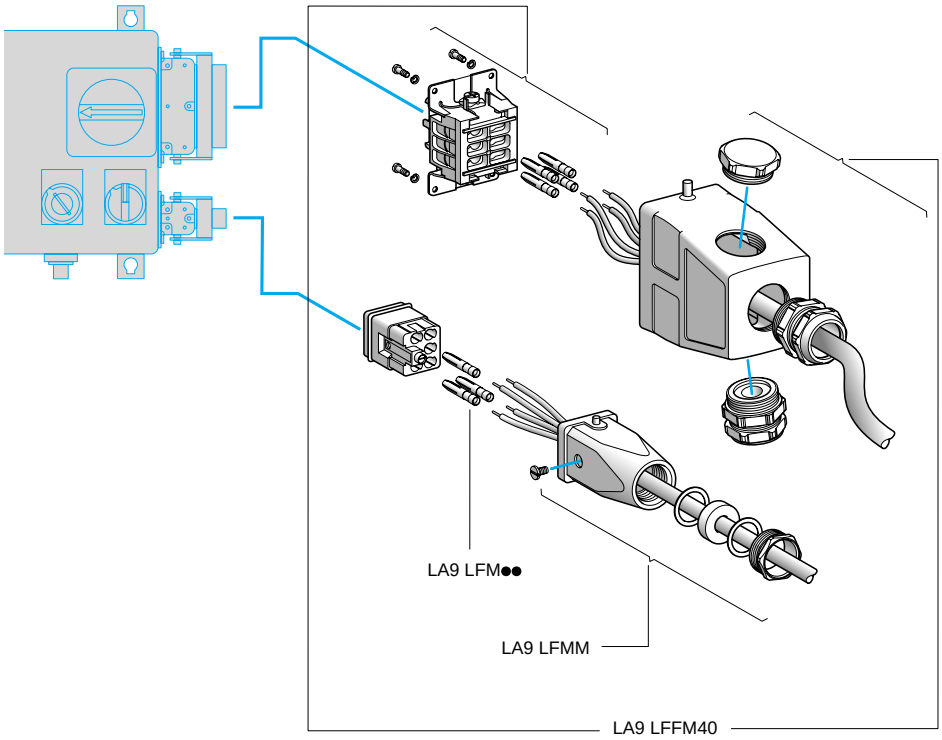
Power extension (daisy-chaining)



Terminal



Metal enclosures LF1, LF2



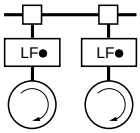
AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters

Accessories for insulated enclosures with variant A74

Presentation

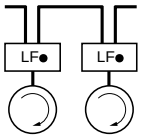
In order to reduce setting-up times and to simplify maintenance, variant A74 LF starters are fitted with Harting plug-in connectors. These starters are designed to allow 2 types of connection topology.

Connection using tap links



This configuration avoids having to switch off the power supply when replacing or adding one or more starters. Although machine availability is increased, a larger number of power connections is required: 4 per starter.

Connection using power extension (daisy-chaining)



The number of power connections per starter is halved, but continuity of service is no longer assured if any of the "upstream" starters are disconnected or removed. With this type of installation, special precautions must be taken because removal of a starter at the head of the power supply line de-energises all the remaining starters on that line. For safety reasons therefore, starters must not be removed under load (prohibited by standard EN60204 above 3kW/400V).

The 2 connection kits and accessories shown below have been designed to facilitate setting up of power extension configurations by the user.

Connection kit (depending on enclosure application)

Enclosure application	Capacity	Kit contents	For mounting on	Reference	Weight
	mm²				kg
Power extension	3-pole 1.5 or 2.5	1 female connector 2 male connectors and corresponding power sockets *(1)*	IP 55 enclosures LF1, LF2, LF7, LF8	**LA9 LFC**	0.150
Terminal	3-pole 1.5 or 2.5	1 female connector 1 male connector, 1 blanking plug and corresponding power sockets *(1)*	IP 55 enclosures LF1, LF2, LF7, LF8	**LA9 LFT**	0.110

Crimping contacts

Type	Capacity mm²	Sold in lots of	Unit reference	Weight kg
Male	1.5	100	**LA9 LFM15**	0.120
	2.5	100	**LA9 LFM25**	0.120
Female	1.5	100	**LA9 LFF15**	0.160
	2.5	100	**LA9 LFF25**	0.150

Accessories for metal enclosures with variant A74

Connection kit

For connector	Kit contents	For mounting on	Reference	Weight
				kg
Input	1 metal cover 2 size 16 cable glands 1 blanking plug 1 female power socket (3P + earth) 4 female crimping contacts *(2)*	Metal enclosures LF1, LF2	**LA9 LFFM40**	0.260
Output to motor	1 metal cover 1 size 16 cable gland 1 female power socket (3P + earth) *(1)*	Metal enclosures LF1, LF2	**LA9 LFMM**	0.060

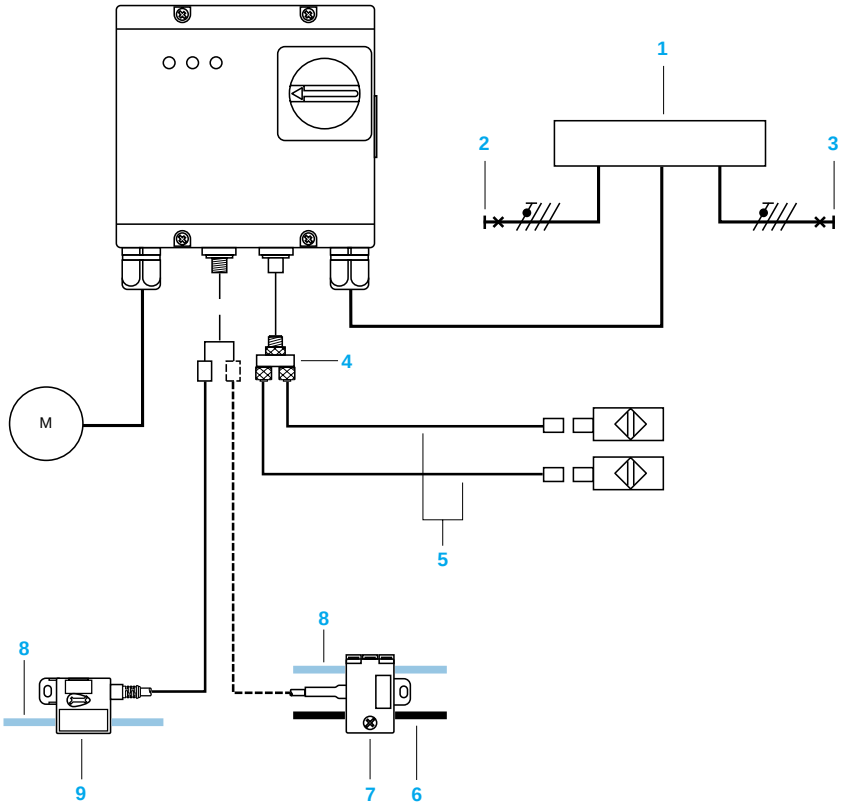
Crimping contacts

Type	Capacity	Thermal current	Voltage	Sold in lots of	Unit reference	Weight
	mm²	A	V			kg
Male	1.5	10	400	100	**LA9 LFM15**	0.120
	2.5	10	400	100	**LA9 LFM25**	0.120

(1) Crimping contacts to be ordered separately.
(2) For flexible cable, 4 mm² maximum, Ith: 16 A, Us: 400 V.

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters

Starters in enclosures with cable glands



1 Junction box

2 Incoming power

3 Power extension

4 **XZ LC1220C1**: splitter block

5 **XZ CR1511040A●**: extension

6 **XZ CB1●●02**: flat cable (black) for auxiliary supply

7 **XZ CG01403D**: tap link for two cables

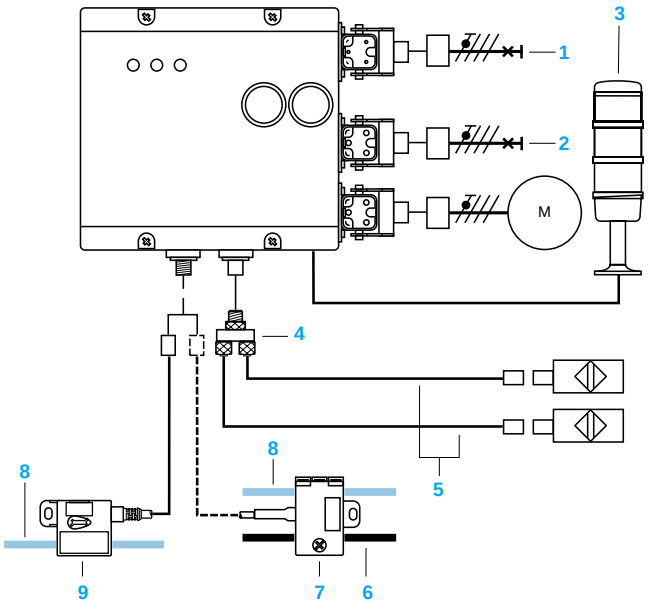
8 **XZ CB1●●01**: flat cable (yellow) for AS-Interface

9 **XZ CG01205D**: tap link for one cable

Functions : pages 2/18 to 2/21
Characteristics : pages 2/22 to 2/25
References : pages 2/27 and 2/28
Dimensions, schemes : pages 2/34 to 2/41

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters

Starters in insulated enclosures with HARTING type plug-in power connectors

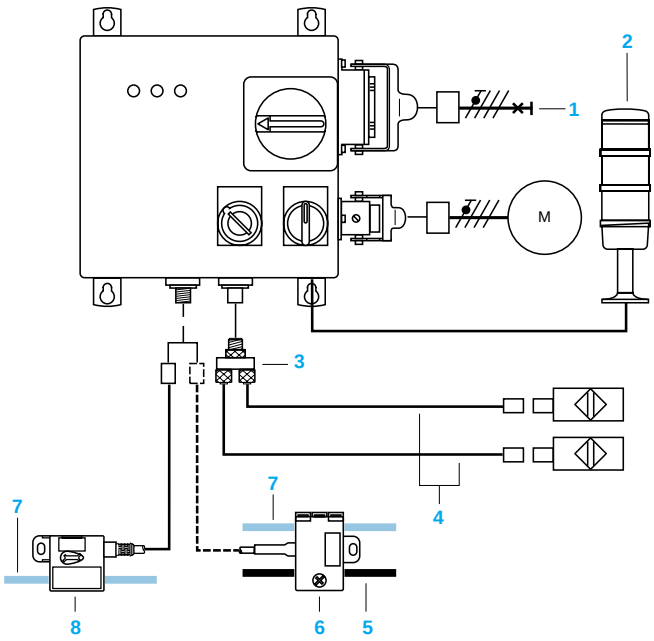


1 Incoming power
2 Power extension
3 Control relay (example: illuminated indicator bank)
4 **XZ LC1220C1**: splitter block
5 **XZ CR1511040A●**: extension
6 **XZ CB1●●02**: flat cable (black) for auxiliary supply
7 **XZ CG01403D**: tap link for two cables
8 **XZ CB1●●01**: flat cable (yellow) for AS-Interface
9 **XZ CG01205D**: tap link for one cable

Configuration of HARTING connectors to be fitted on cables
(to be ordered separately)

	Number and HARTING reference	
	for incoming power female connector	for power extension and motor connection male connectors
Straight cover	1 x **09-20-003-0420**	2 x **09-20-003-0420**
Male insert 6-way, 400 V	–	2 x **09-12-005-3101**
Female insert 6-way, 400 V	1 x **09-12-005-3001**	–
Male contacts 2.5 mm²	–	8 x **09-33-000-6102**
Female contacts 2.5 mm²	3 x **09-33-000-6202**	–
Plug for the last socket	–	1 x **09-20-003-5408**

Starters in metal enclosures with HARTING type plug-in power connectors



1 Incoming power
2 Control relay (example: illuminated indicator bank)
3 **XZ LC122C1**: splitter block
4 **XZ CR1511040A●**: extension
5 **XZ CB1●●02●**: flat cable (black) for auxiliary supply
6 **XZ CG1403D**: tap link for two cables
7 **XZ CB1●●01●**: flat cable (yellow) for AS-Interface
8 **XZ CG01205D**: tap link for one cable

Configuration of HARTING connectors to be fitted on cables
(to be ordered separately)

	Number and HARTING reference	
	for incoming power female connector	for power extension and motor connection male connectors
Straight cover	1 x **09-30-006-442** *(1)* 1 x **09-30-006-443** *(2)*	2 x **09-20-003-1440**
Male insert 6-way, 400 V	–	2 x **09-12-005-3101**
Female insert 6-way, 400 V	1 x **09-33-006-2702**	–
Male contacts 2.5 mm²	–	5 x **09-33-000-6102**
Female contacts 2.5 mm²	3 x **09-33-000-6207**	–

(1) PG21.
(2) PG29.

AS-Interface cabling system

Dedicated components

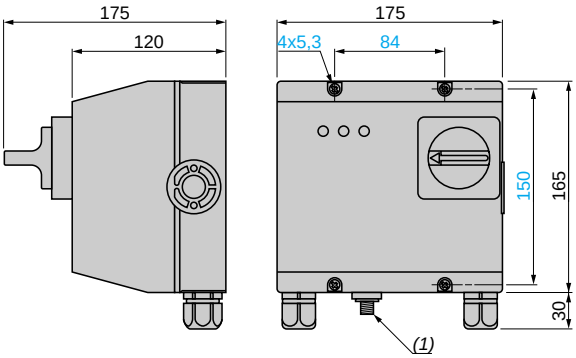
D.O.L. starters in insulated enclosure

Models LF1 P, LF2 P, LF7 P and LF8 P

Non-reversing and reversing starters with rotary control knob

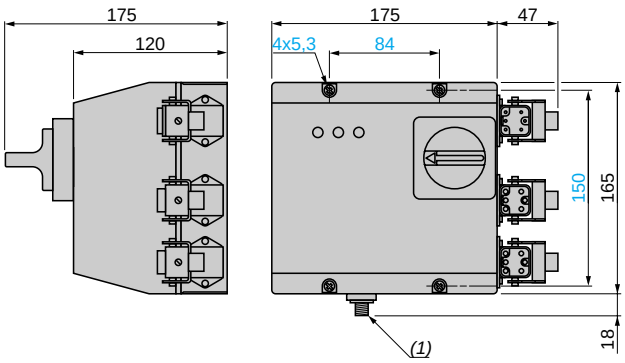
With cable glands

LF● P●●D



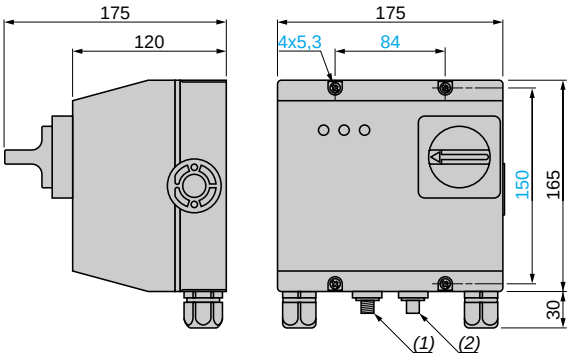
With HARTING plug-in connectors (A74)

LF● P●●DA74



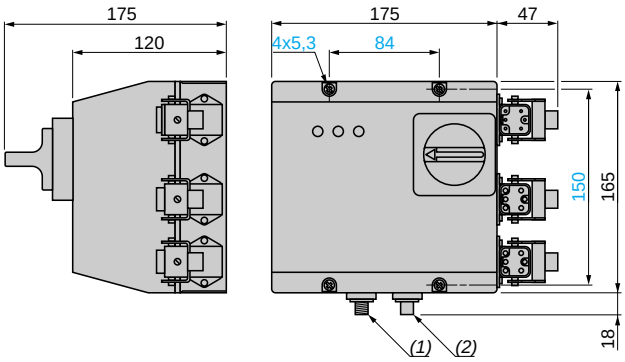
With cable glands
Incorporating sensor variant (A78)

LF● P●●DA78



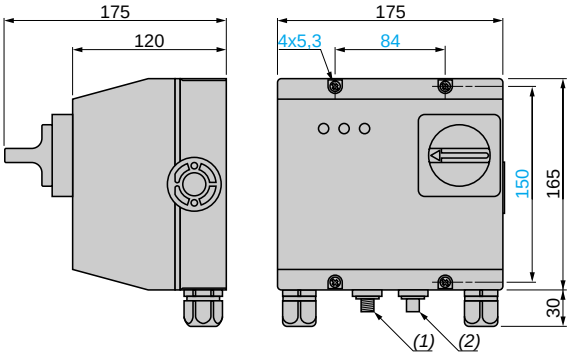
With HARTING plug-in connectors (A74)
Incorporating sensor variant (A78)

LF● P●●DA78A74



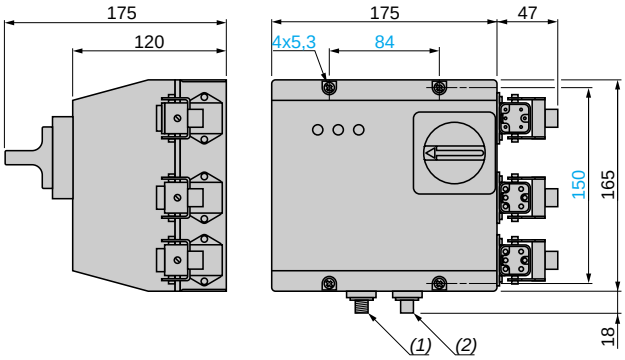
With cable glands
Incorporating sensor and local/AS-Interface control variant (A79)

LF● P●●DA79



With HARTING plug-in connectors (A74)
Incorporating sensor and local/AS-Interface control variant (A79)

LF● P●●DA79A74



Knock-outs for cable gland	
From above	2 x Pg16 and 2 x Pg13
From below	1 x Pg16

(1) M12 male connector for connection to AS-Interface
(2) M12 female connector for connection to sensor.

References :
pages 2/26 to 2/29

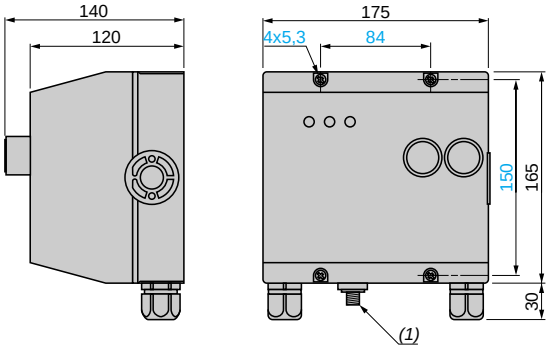
Schemes :
pages 2/38 to 2/41

AS-Interface cabling system
Dedicated components
D.O.L. starters in insulated enclosure
Models LF1 M and LF2 M

Non-reversing and reversing starters with pushbutton control

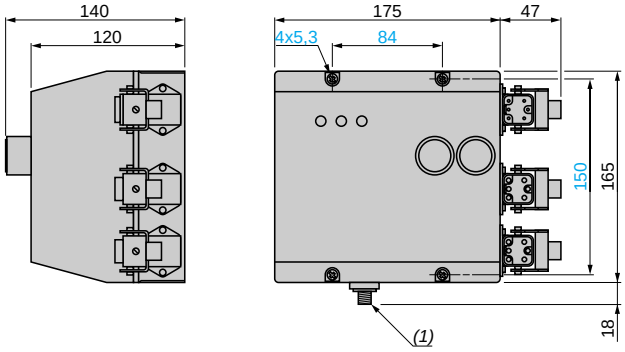
With cable glands

LF● M●●D



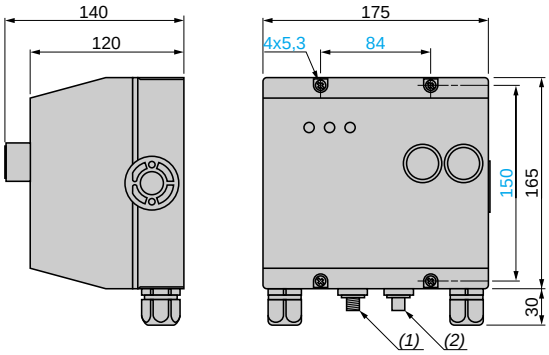
With HARTING plug-in connectors (A74)

LF● M●●DA74



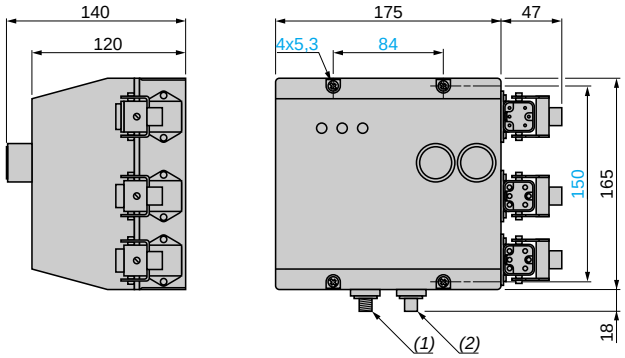
With cable glands
Incorporating sensor variant (A78)

LF● M●●DA78



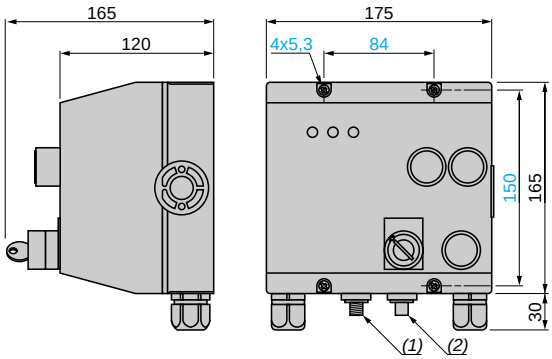
With HARTING plug-in connectors (A74)
Incorporating sensor variant (A78)

LF● M●●DA78A74



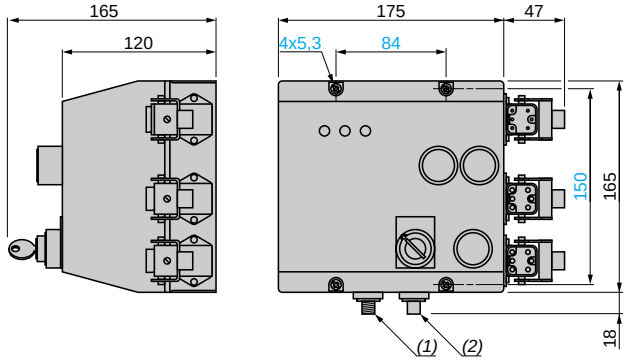
With cable glands
Incorporating sensor and local/AS-Interface control variant (A79)

LF● M●●DA79



With HARTING plug-in connectors (A74)
Incorporating sensor and local/AS-Interface control variant (A79)

LF● M●●DA79A74



Knock-outs for cable gland	
From above	2 x Pg16 and 2 x Pg13
From below	1 x Pg16

(1) M12 male connector for connection to AS-Interface
(2) M12 female connector for connection to sensor.

References :
pages 2/26 to 2/29

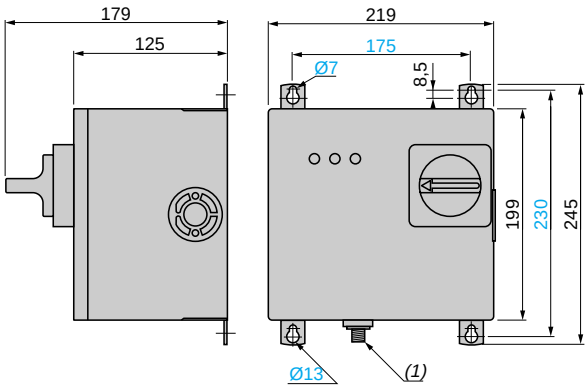
Schemes :
pages 2/38 to 2/41

AS-Interface cabling system
Dedicated components
D.O.L. starters in metal enclosure
Models LF1 MP and LF2 MP

Non-reversing and reversing starters with rotary control knob

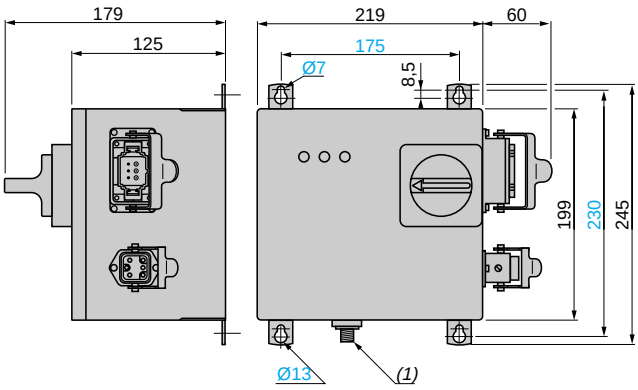
With cable glands

LF● MP●●D



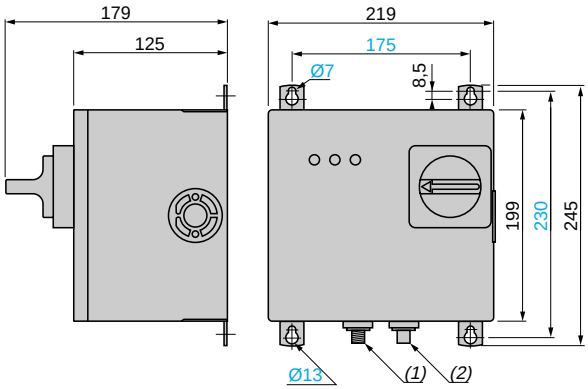
With HARTING plug-in connectors (A74)

LF● MP●●DA74



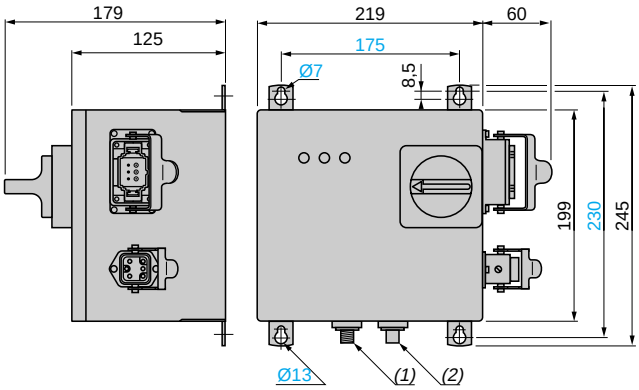
With cable glands
Incorporating sensor variant (A78)

LF● MP●●DA78



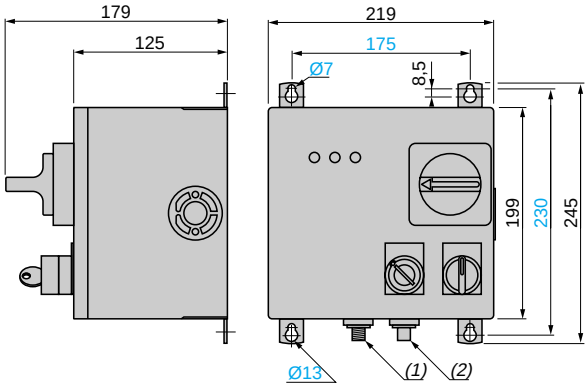
With HARTING plug-in connectors (A74)
Incorporating sensor variant (A78)

LF● MP●●DA78A74



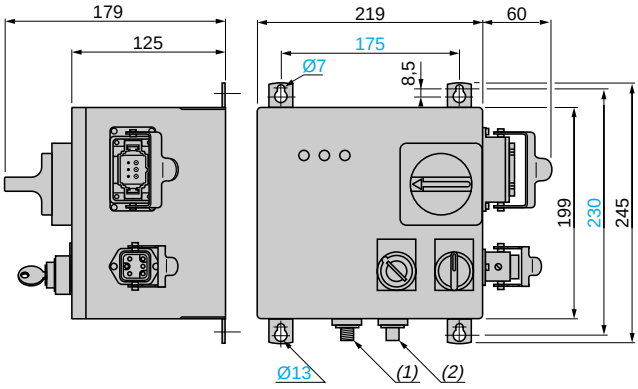
With cable glands
Incorporating sensor and local/AS-Interface control variant (A79)

LF● MP●●DA79



With HARTING plug-in connectors (A74)
Incorporating sensor and local/AS-Interface control variant (A79)

LF● MP●●DA79A74



Knock-outs for cable gland	Standard enclosure	Enclosure with variant A74
From above	3 x Pg16	1 x Pg16
From below	2 x Pg16	1 x Pg16

(1) M12 male connector for connection to AS-Interface
(2) M12 female connector for connection to sensor.

References :
pages 2/26 and 2/27

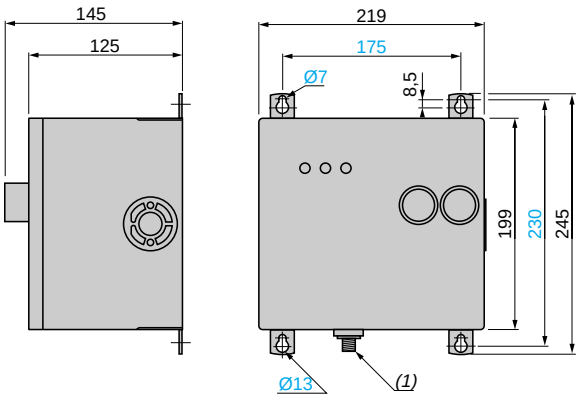
Schemes :
pages 2/39 to 2/41

AS-Interface cabling system
Dedicated components
D.O.L. starters in metal enclosure
Models LF1 MM and LF2 MM

Non-reversing and reversing starters with pushbutton control

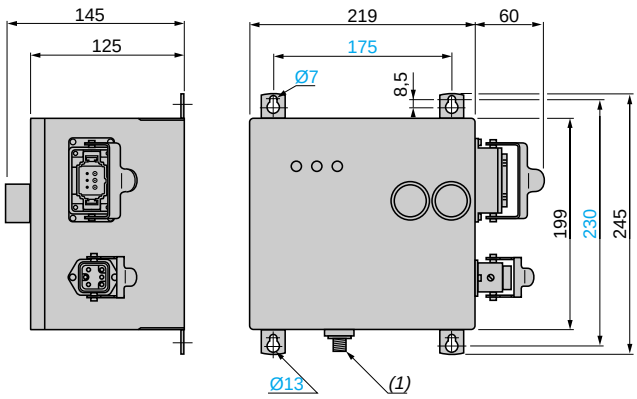
With cable glands

LF● MM●●D



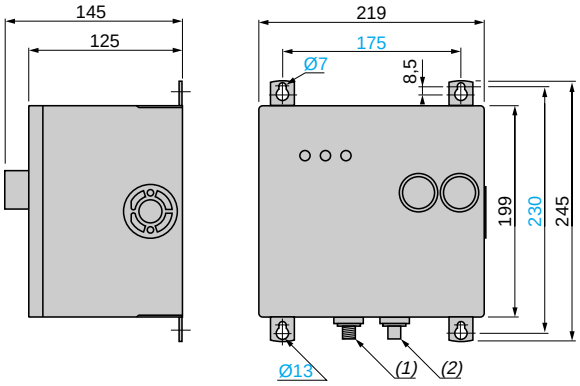
With HARTING plug-in connectors (A74)

LF● MM●●DA74



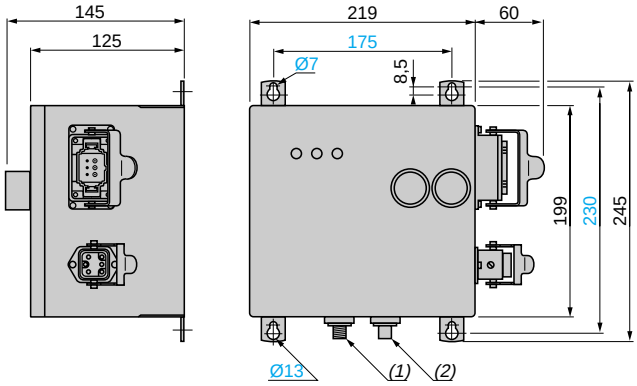
With cable glands
Incorporating sensor variant (A78)

LF● MM●●DA78



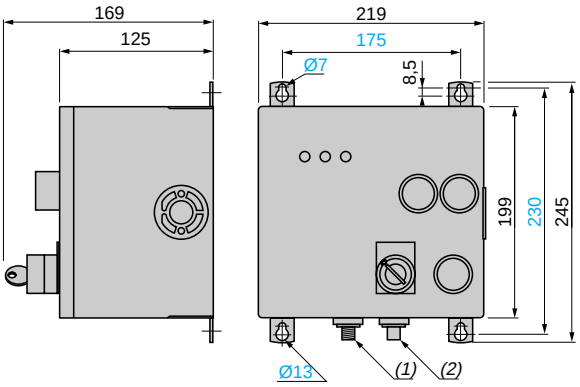
With HARTING plug-in connectors (A74)
Incorporating sensor variant (A78)

LF● MM●●DA78A74



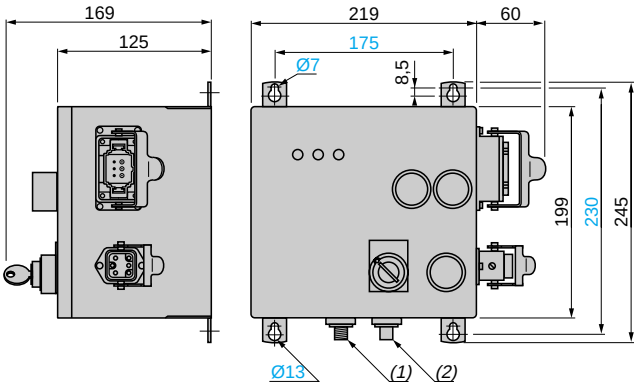
With cable glands
Incorporating sensor and local/AS-Interface control variant (A79)

LF● MM●●DA79



With HARTING plug-in connectors (A74)
Incorporating sensor and local/AS-Interface control variant (A79)

LF● MM●●DA79A74



Knock-outs for cable gland	Standard enclosure	Enclosure with variant A74
From above	3 x Pg16	1 x Pg16
From below	2 x Pg16	1 x Pg16

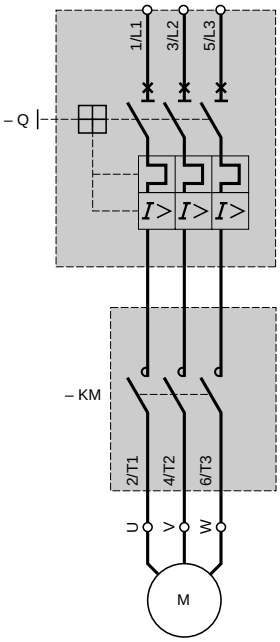
(1) M12 male connector for connection to AS-Interface
(2) M12 female connector for connection to sensor.

References :
pages 2/26 and 2/27

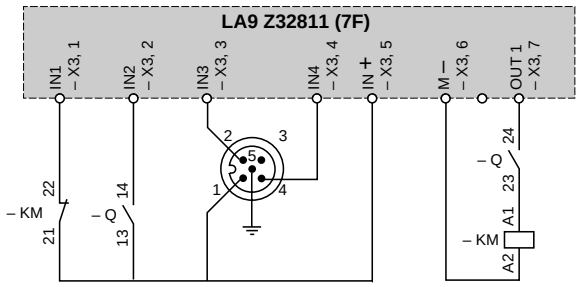
Schemes :
pages 2/39 to 2/41

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters
Models LF7 and LF8

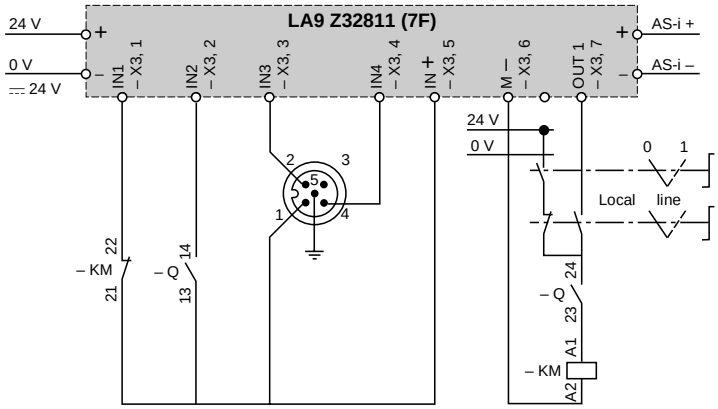
Non-reversing starters LF7



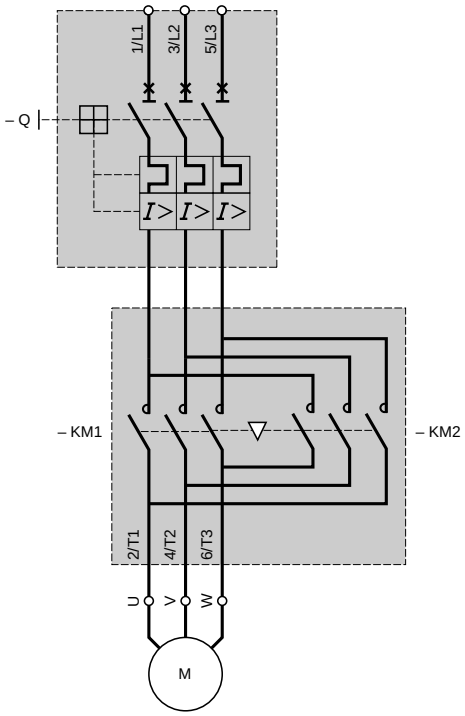
LF7



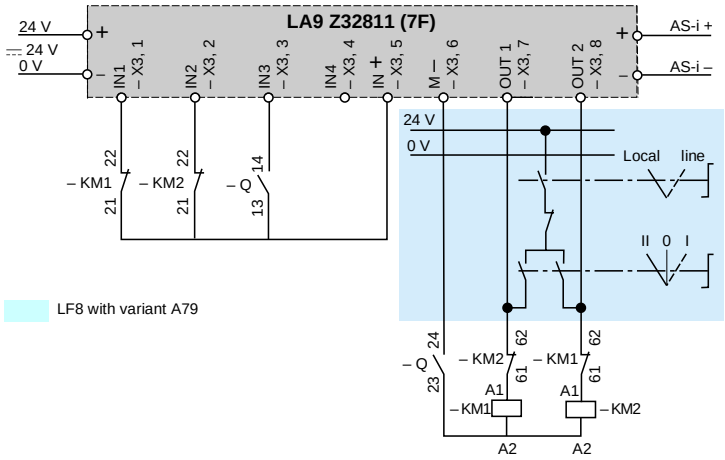
LF7 with variant A79



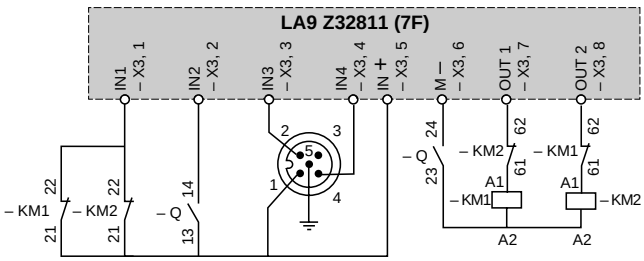
Reversing starters LF8



LF8 without variant and LF8 with variant A79



LF8 with variant A78

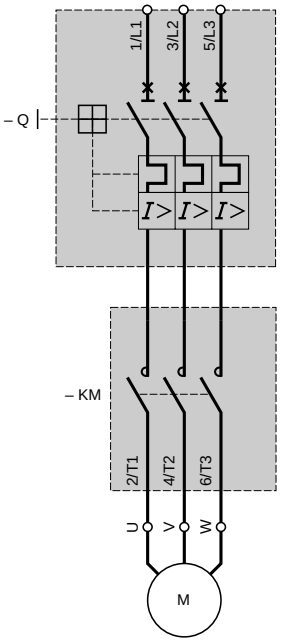


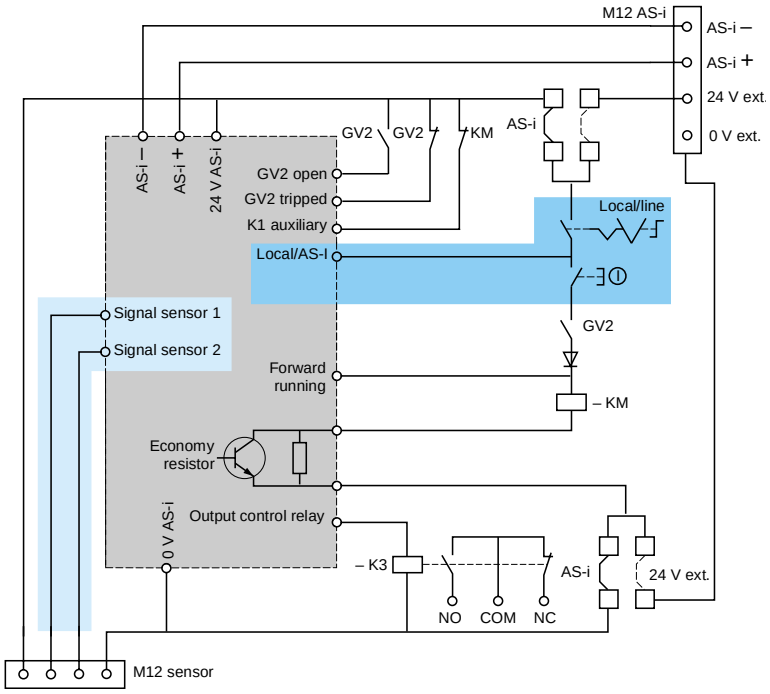
References :
pages 2/28 and 2/29

Dimensions :
pages 2/34 and 2/35

AS-Interface cabling system
Dedicated components
Enclosed D.O.L. starters
Models LF1 and LF2

Non-reversing starters LF1

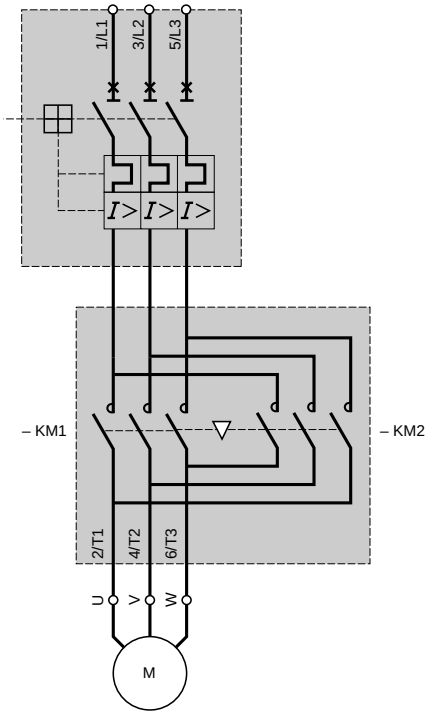


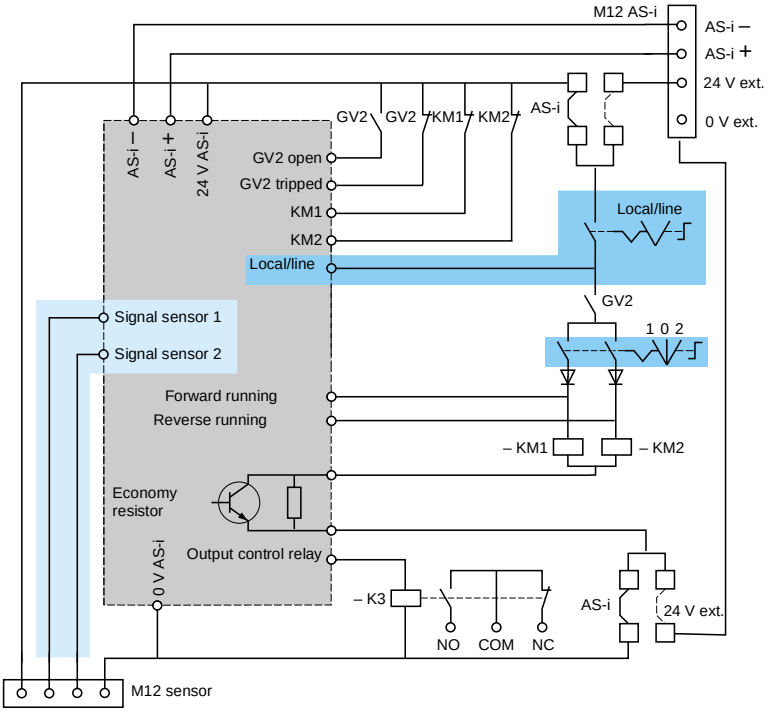


Insulated enclosure with variant A78

\+ Insulated enclosure with variant A79 or metal enclosure with variant A79

Reversing starters LF2





Insulated enclosure with variant A78

\+ Insulated enclosure with variant A79 or metal enclosure with variant A79

References :
pages 2/26 and 2/27

Dimensions :
pages 2/34 to 2/37

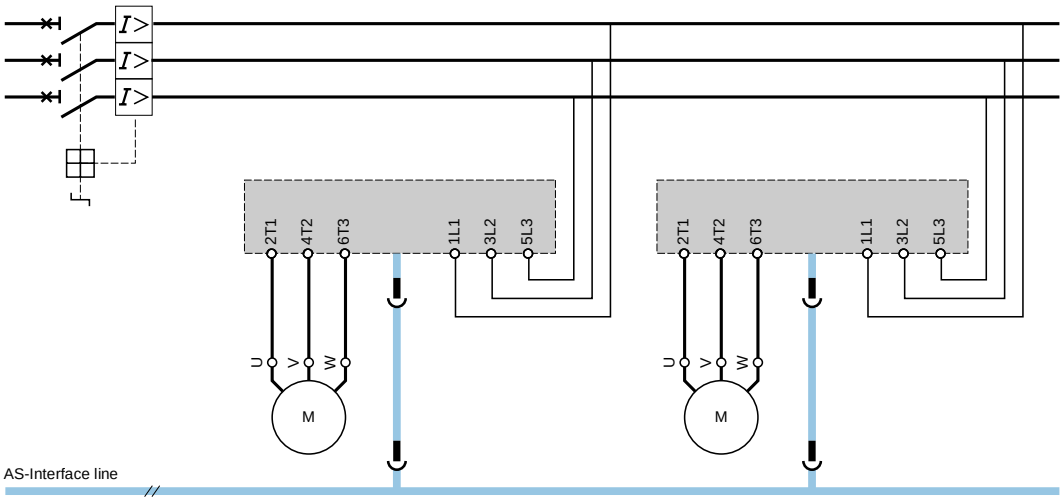
AS-Interface cabling system

Dedicated components

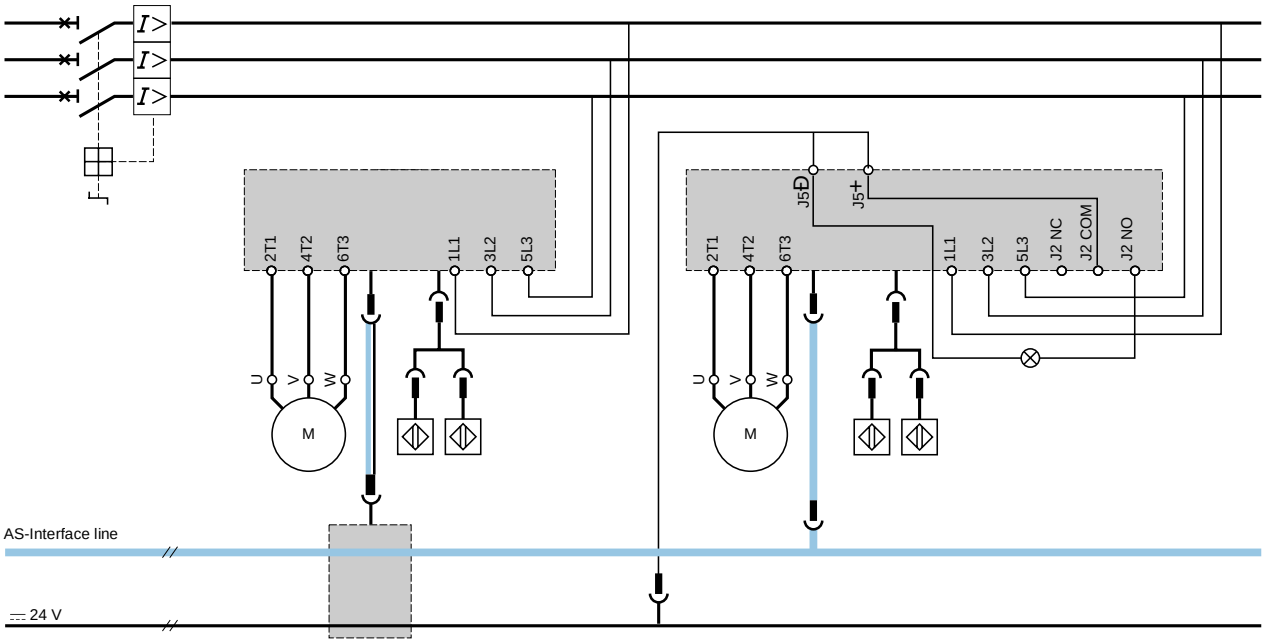
Enclosed D.O.L. starters

Models LF1, LF2, LF7 and LF8

Non-reversing and reversing starters without sensor and without an auxiliary supply



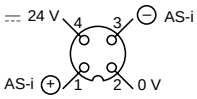
Non-reversing and reversing starters with 2 sensors, an auxiliary supply and a control relay



References : pages 2/26 to 2/29
Dimensions : pages 2/34 to 2/37

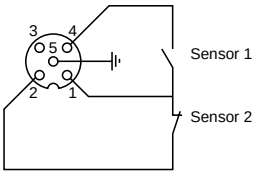
Connections on enclosures (LF1, LF2 only)

M12 male connector for AS-Interface and ⎓ 24 V auxiliary supply

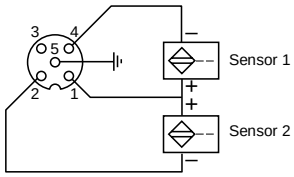


Sensor M12 female connector
(for starters LF1 and LF2, only applicable to starters with sensor variants A78 and A79)

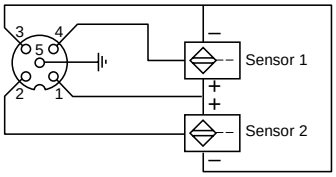
Limit switch



2-wire PNP type sensor



3-wire PNP type sensor



References :
pages 2/26 to 2/29

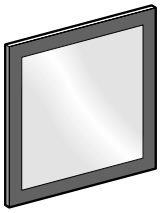
Dimensions :
pages 2/34 to 2/37

AS-Interface cabling system
Dedicated components
Tego Dial for Human-Machine interfaces on AS-Interface cabling system

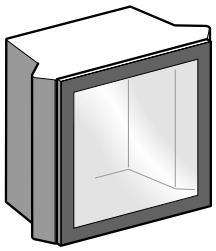
Presentation

The modular Tego Dial system is used to define Human-Machine interfaces. It facilitates the installation of Ø 22, 16 and 30 mm control and signalling units, DIN format display units, Magelis terminals and display units, XBL keypads and other products.
Tego Dial covers all application needs:
- definition of the application by Tego Dial Design software,
- quick assembly of control, signalling and display units, through the use of modular elements,
- standard connections from the control and signalling units to PLCs, buses and other products,
- easy integration of the dialogue application into the machine, control panel, enclosure or machine housing, either directly or using suspension arms.

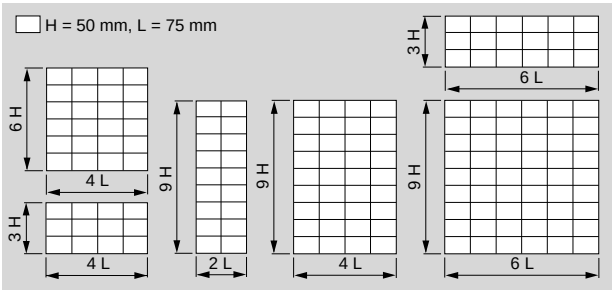
Description



1



3



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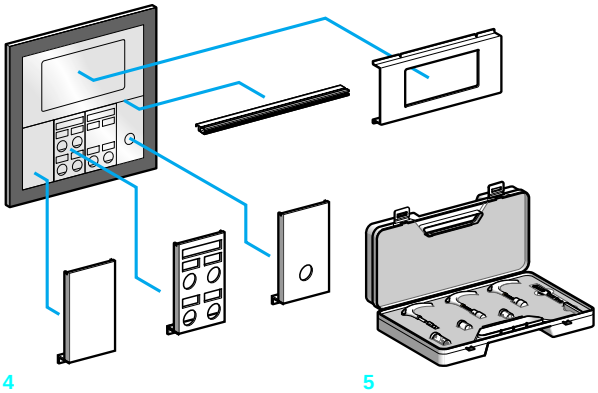


4

5

■ Tego Dial Design definition software

This software on CD-ROM facilitates graphical definition of the dialogue application in relation to the control units, pilot lights and display units necessary for the device. It selects the correct Tego Dial components that are required for the application and also features a legend design and printing function, for both the front panel and the connections.

■ Dialboard front panels 1

The front panels basically comprise a grey, RAL 7016, painted aluminium frame which is covered by a polycarbonate film.
6 sizes are available 2, based on a modular pattern of height H = 50 mm and width L = 75 mm. The sizes are 3H x 4L, 3H x 6L, 6H x 4L, 9H x 2L, 9H x 4L and 9H x 6L.

■ Dialpack control console enclosures 3

Four control consoles are available in the following modular sizes:
3H x 4L, 6H x 4L, 9H x 4L and 9H x 6L.
The Dialpack console is an assembly comprising a Dialboard type front panel and a sheet steel folded and welded enclosure, painted in textured grey RAL 7016.
The front panel is hinged and can be opened to 120°. Closing is by a 1/4 turn device, with stop and locking by Ronis key n° 455. Double bar or CNOMO triangular key locks are also available. A customising component in 2 versions - yellow or unpainted - enhances the Dialpak unit and makes it more ergonomic. A Dialpack S version in stainless steel type 304 is available for corrosive environments. This version conforms to enclosure standard EN 50298.

■ Plates and cross-pieces 4

A range of modular dimensioned plates facilitates the installation of all combinations of control and signalling units, operator dialogue terminals and other devices. These plates are attached directly to the framework of the front panel.
The plates, made from sheet steel and painted grey RAL 7016, are designed for the following product ranges:
- Ø 22, Ø 16, and Ø 30 control and signalling units,
- DIN format display units,
- electronic operator terminals and displays (Magelis and others),
- keypads,
- other units: joystick controllers, cam switches, etc.

Cross-pieces aid vertical mounting of several rows of plates.
Cut-outs in the plates are dimensioned to suit the dialogue or display units that are to be installed. Some plate versions for Ø 22 units are available with knock-outs, which need to be removed before mounting the unit. Other versions incorporate cut-outs for clip-in mounting of the transparent polycarbonate legend holders included with the plates. Alternatively, solid plates are also available for mounting any special equipment required.

■ Tool Kit 5

The installation of dialogue and display units requires cut-outs to be made through the polycarbonate film. To simplify this operation, the plate is marked with cut-out guides and a tool kit is available, comprising cutting tools and replacement blades.

■ Pre-assembled kits

Dialboard and Dialpack with pre-assembled plates and cross-pieces are available.

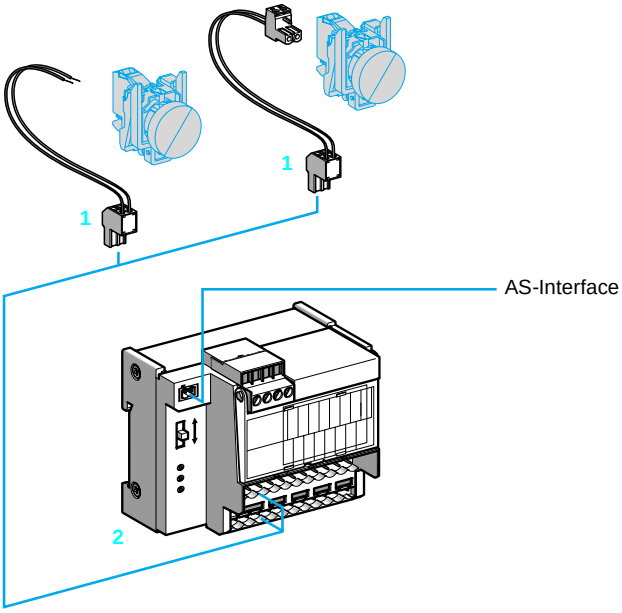
Characteristics : page 2/44
References : page 2/45
Dimensions : page 2/45

AS-Interface cabling system

Dedicated components

Tego Dial for Human-Machine interfaces on AS-Interface cabling system

Standard connection



Tego Dial offers a range of interface components and cabling accessories that simplify connections between control and signalling units on the one hand, and PLCs, buses and other products on the other.
The main components which make up this range are:
- prefabricated connection cables and insulation displacement connectors 1, on 5 mm pitch, for connecting control and signalling units to Dialbase interfaces;
- a Dialbase AS-Interface 4I/4O interface 2, with integrated commons for connecting control and signalling units to the cabling system.

Suspension arms

The Dialpack control console can be fitted directly using 4 adjustable lugs, AE3 FX122.
However, for improved ergonomy, it is usually mounted on a suspension arm. This can be either fixed (Dialfix) or moving (Dialmove).

■ Dialfix fixed arms
Two versions are available:
- a straight fixed arm kit, comprising a straight Ø 70 mm tube, 500 or 1000 mm in length, and a pair of clamps (one for each end). Depending on which way round the clamps are fitted, an inclination of +/- 15° from the neutral position can be achieved;
- an elbowed (90°) fixed arm kit, 500 mm in length. This kit also includes the pair of clamps described above.

■ Arms for corrosive environments
These arms are in 304 type stainless steel and provide 350° rotation on the Dialpack fixing side.
Two models are available:
- straight arm kit, length 1000 mm,
- 90° elbowed arm kit, length 500 mm.

■ Dialmove moving arms
This arm enables an extensive choice of mounting configurations. The cabling runs through the elements which have removable side covers for easy access.
Various configurations can be achieved by combining the following components:
- straight tubes (100 to 1000 mm long),
- fixed 90° joint,
- wall fixing brackets (straight or elbowed, fixed or mobile),
- straight fixing plates (one fixed, one rotating) for Dialpack,
- 15° tilted joints,
- pivoting joint (-90° to +90°) in the same plane.

Characteristics : page 2/44
References : page 2/45
Dimensions : page 2/45

AS-Interface cabling system
Dedicated components
Tego Dial for Human-Machine interfaces on AS-Interface cabling system

Environment

Products			APE 1FASI1
Protective treatment			"TC"
Degree of protection (against direct contact)	Conforming to IEC 529		IP 20
Product certifications			UL, CSA
			BV pending
			AS-i N° 179 (for **APE 1FASI1** only)
Resistance to incandescent wire	Conforming to IEC 695-2-1	**°C**	750 extinction < 30 s
Resistance to mechanical impact	Conforming to IEC 68-2-27	**ms**	11 (half sine wave)
			15 gn (acceleration)
Vibration resistance	Conforming to Bureau VERITAS	**Hz**	5…100
			0.7 gn (acceleration)
Resistance to electrostatic discharge	Conforming to IEC 1000-4-2		Level 3
Resistance to radiated fields	Conforming to IEC 1000-4-3	**MHz**	Level 3
Resistance to fast transients	Conforming to IEC 1000-4-4		Level 3
Electrical surge withstand	Conforming to IEC 1000-4-5	**kV**	1 at 2 Ω (serial mode), 2 at 12 Ω (common mode)
Ambient air temperature	Conforming to IEC 1131-2	**°C**	- 5…+ 60 (operation)
	Conforming to IEC 1131-2	**°C**	- 40…+ 80 (storage)
Insulation voltage	Terminals/mounting rails	**kV**	2 (for 1 minute)
Installation category	Conforming to IEC 664		II
Degree of pollution	Conforming to IEC 664		2
Mounting	Standard mounting rail/support supplied	**mm**	Height of standard ⊓⊔ mounting rail 7.5 or 15

Connections

Base type	APE 1FASI1
Number of channels and functions	4 inputs, 4 solid state outputs
Connector type, component side	2-pin, 5 mm pitch per channel
Connector type, AS-Interface side	2 x 2-pin, 5 mm pitch

Presentation :
pages 2/42 and 2/43

AS-Interface cabling system

Dedicated components

Tego Dial for Human-Machine interfaces on AS-Interface cabling system

Dialbase for connection via the AS-Interface line

Description	Connector type to		Voltage Ue	Number of inputs	Number of outputs	Reference	Weight
	Components	AS-Interface line					
			⎓ V				kg
Dialbase AS-Interface 4I/4O	2-pin, 5 mm pitch per channel	2 x 2-pin, 5 mm pitch	24	4 channels supplied via the AS-Interface line	4 solid state channels, external supply	**APE 1FASI1**	0.240

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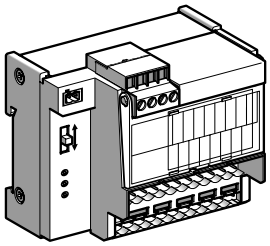
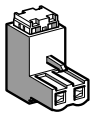


APE 1FASI1

Connectors and cables for control and signalling units

Description	For units	Wire c.s.a.	Cable length	Sold in lots of	Unit reference	Weight
		mm^2	mm			kg
Self-stripping connector 2-pin, 5 mm pitch	Ø 22	0.75	–	16	**APE 1PAD21**	0.020
Cable with 1 connector 2-pin, 5 mm pitch	Ø 22	0.75	500 *(1)*	8	**APE 1C2150**	0.120
Cable with 2 connectors 2-pin, 5 mm pitch	Ø 22	0.75	500 *(1)*	8	**APE 1C2250**	0.130
Cable with 2 connectors 2-pin, 5 mm pitch and 2-pin Faston connector	Ø 16	0.75	500 *(1)*	8	**APE 1C1250**	0.130

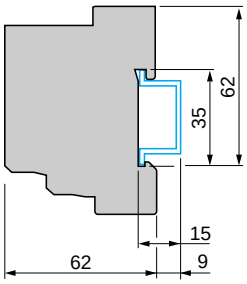
819529

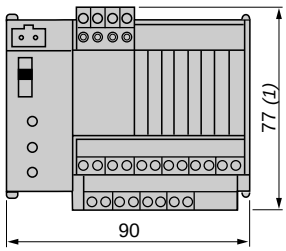


APE 1PAD21

Dimensions

Dialbase APE 1FASI1





(1) Connector fitted

Presentation :
pages 2/42 and 2/43

AS-Interface cabling system
Dedicated components
Control stations and adapter for control and signalling units

Environment

Control stations XAL SZ200●			
Product certifications			AS-Interface N° 06301
Ambient air temperature around the device	Operation	**°C**	- 25…+ 70
	Storage	**°C**	- 40…+ 70
Degree of protection			IP 65
Vibration resistance			15 gn (f = 40…500 Hz) conforming to IEC 68-2-6
Shock resistance			70 gn conforming to IEC 68-2-27 (pushbuttons)
Materials			Polycarbonate enclosure, coloured grey RAL 7035 and grey RAL 7021
Enclosure flame resistance			NF C 20-455: 960 °C, UL 94: V0
Mechanical life			3 million operating cycles
Connection			By M12 male connector
Adapter XAL SZ1 for control and signalling units			
Product certifications			UL
Ambient air temperature around the device	Operation	**°C**	- 25…+ 70
	Storage	**°C**	- 40…+ 70
Degree of protection			IP 20
Connection		**mm²**	2 x 4 wires, 0.6

Electrical characteristics

Control stations XAL SZ200●			
Power supply			Via the AS-Interface line
Current consumption, AS-Interface line	XAL S2001, XAL S2002	**mA**	< 40
	XAL S2003	**mA**	< 80
Contact blocks			1 N/C and 1 N/O, 24 V, 5mA
Illuminated pushbutton LEDs	XAL S2003		LED, ⎓ 24 V, 20 mA
Short-circuit protection			Yes, for the LED indicators
Adapter XAL SZ1 for control and signalling units			
Power supply			Via the AS-Interface line
Current consumption, AS-Interface line		**mA**	< 80
Inputs			For 2 N/C or N/O discrete contacts: 24 V, 5 mA
Outputs			For 2 LED indicators: ⎓ 24 V, 20 mA With short-circuit protection

Communication characteristics

Control stations XAL SZ200●				
AS-Interface profile			S.3.F	
Data bits (Status)	Bit value		**0**	**1**
	Status D0 (I)		Pushbutton “I” unoperated (N/O contact open)	Pushbutton “I” operated (N/O contact closed)
	Status D1 (I)		Pushbutton “O” operated (N/C contact open)	Pushbutton “O” unoperated (N/C contact closed)
Data bits (Commands) (**XAL S2003** only)	Bit value		0	1
	Command D2 (O)		Green indicator off	Green indicator on
	Command D3 (O)		Red indicator off	Red indicator on
Parameter bits	Parameters P0 to P3		Not used	
Adapter XAL SZ1 for control and signalling units				
AS-Interface profile			S.3.F	
Data bits (Status)	Bit value		**0**	**1**
	Status D0 (I)		Pushbutton 1, contact open	Pushbutton 1, contact closed
	Status D1 (I)		Pushbutton 2, contact open	Pushbutton 2, contact closed
Data bits (Commands)	Bit value		**0**	**1**
	Command D2 (O)		Indicator 1 off	Indicator 1 on
	Command D3 (O)		Indicator 2 off	Indicator 2 on
Parameter bits	Parameters P0 to P3		Not used	

AS-Interface cabling system

Dedicated components

Control stations and adapter for control and signalling units

References

Control stations for AS-Interface cabling system

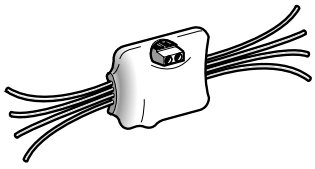
Description	Pushbutton colours	Reference	Weight kg
Control stations With 2 spring return flush pushbuttons, Ø 22 mm	Pushbutton “I” (N/O contact): white Pushbutton “O” (N/C contact): black	**XAL S2001**	0.190
	Pushbutton “I” (N/O contact): green Pushbutton “O” (N/C contact): red	**XAL S2002**	0.190
Control stations With 2 spring return flush, illuminated pushbuttons, Ø 22 mm	Pushbutton 1 (N/O contact): green Pushbutton 2 (N/C contact): red	**XAL S2003**	0.220

XAL S2001, XAL S2002

XAL S2003

Adapter for control and signalling units

Description		Reference	Weight kg
2 input/2 output interfaces	For control stations XAL S200●, customised for operation on the AS-Interface cabling system	**XAL SZ1**	0.050



XAL SZ1

Dimensions

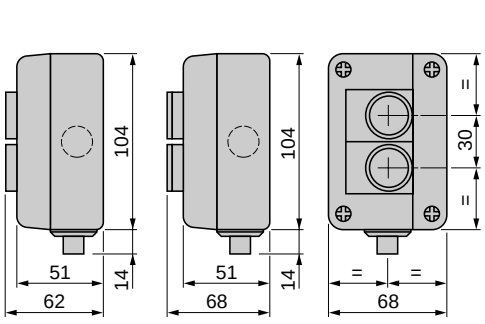
Control stations for AS-Interface cabling system

XAL S2001, XAL S2003

XAL S2003

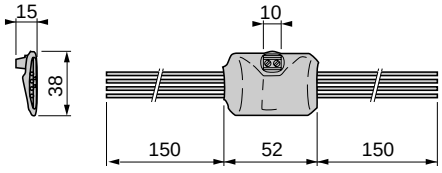
Common front view

Rear housing



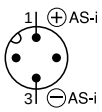
Adapter for control and signalling units

XAL SZ1

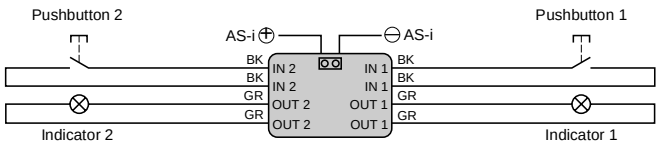


Connections

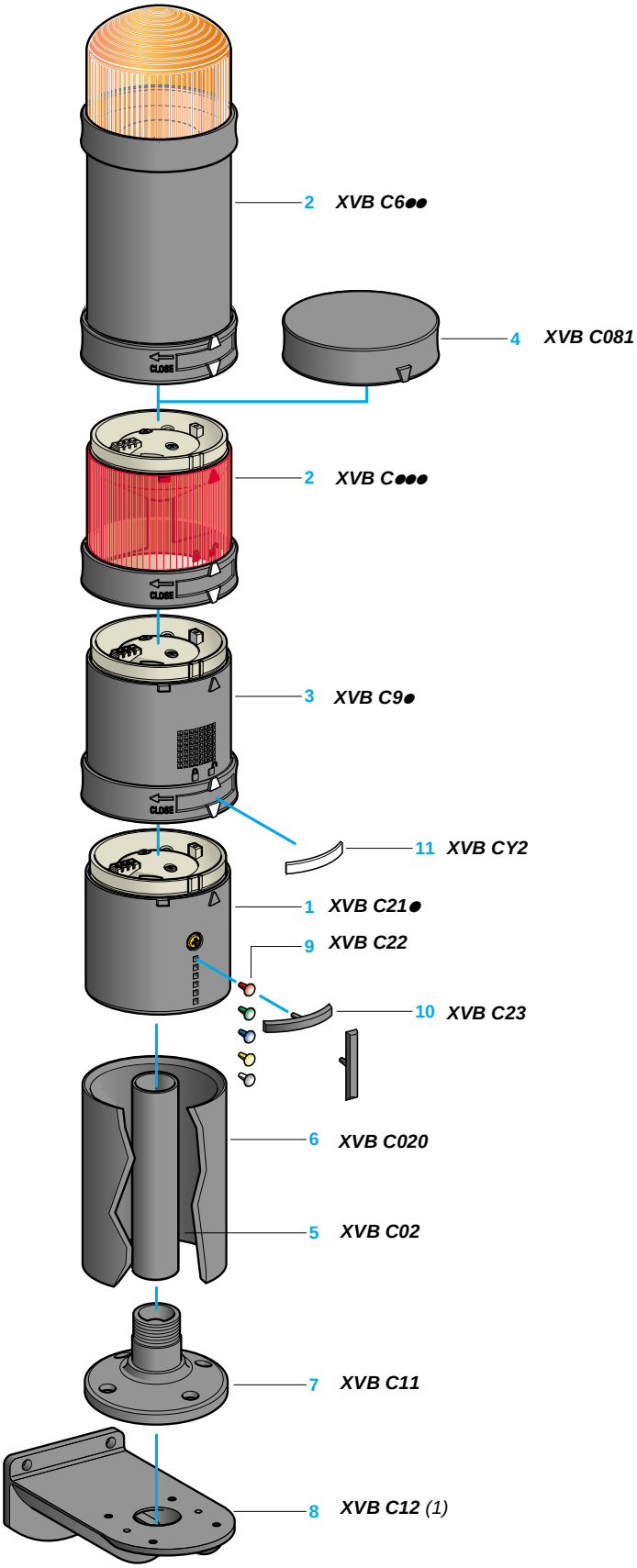
XAL S200●



XAL SZ1



AS-Interface cabling system
Dedicated components
Illuminated indicator banks type XVB



(1) For base unit XVB C21A only.

Characteristics : pages 2/50 and 2/51
References : pages 2/52 to 2/54
Dimensions : page 2/55

AS-Interface cabling system
Dedicated components
Illuminated indicator banks type XVB

XVB illuminated beacons and indicator banks are visual or audible signalling units used mainly to indicate machine operation sequences and to check status from a distance. They are visible through 360°.
Examples: machine start, machine stop, no material, call technical personnel, fault signalling, etc.

XVB indicator banks are connected to the AS-Interface cabling system means of a base unit containing an integrated circuit (ASIC).

Indicator bank
For customer assembly

Variable composition, with up to 4 illuminated or audible signalling units, supplied unassembled (for assembly by the user).

It comprises:
1 A base unit, incorporating a removable terminal block and bottom or side cable entry; an M12 outgoing connector for the AS-Interface line.
2 1 to 4 coloured lens units: green, red, orange, blue, clear or yellow.
3 Or 1 audible signalling unit.
(Maximum configuration:
- 4 illuminated lens units or
- 3 illuminated lens units + 1 audible signalling unit).
4 A top cover (except with discharge tube unit).

The illuminated or audible signalling units stack vertically and are easily locked and unlocked by an integral ring nut.
Only one “flash” discharge tube unit can be fitted on each indicator bank, always at the top.
Electrical connections between each unit are made automatically during assembly.

Accessories

5 Support tube 100, 400 or 800 mm.
6 Support tube concealment cover.
7 Fixing plate screwed onto tube for mounting on a horizontal surface.
8 Fixing plate for mounting on a vertical surface.
9 Coloured markers *(1)*.
10 Legend holders with legend *(1)*.
11 Legends that attach to locking ring of individual signalling units for identification.

Setting-up
Fixing

Base fitted directly onto panel by means of 2 screws or by means of a plate screwed to the support tube.

Cabling

By means of a removable terminal block incorporated in the base unit (simplified wiring). The screw and captive cable clamp terminals are protected to prevent accidental contact with live parts.

(1) These allow the position of the various units (illuminated or audible) to be marked for identification in the event of disassembly.

Characteristics : pages 2/50 and 2/51
References : pages 2/52 to 2/54
Dimensions : page 2/55

AS-Interface cabling system
Dedicated components
Illuminated indicator banks type XVB

Environment

Product certifications	Standard version		CSA, UL (pending)
Conforming to standards			IEC/EN 60947-5-1
Protective treatment	Standard version		"TC"
Ambient air temperature	Storage	**°C**	- 20…+ 70
	Operation	**°C**	- 10…+ 50
Shock resistance	Conforming to IEC 68.2.27		25 gn
Vibration resistance	Conforming to IEC 68.2.6		5 gn
Protection against electric shocks conforming to IEC 536	Tube mounting		Class I
	Direct mounting on base unit		Class II
Degree of protection	Conforming to IEC 529 and NF C 20-010		IP 65
	Conforming to UL 508		Type 4X NEMA "Indoor"
Material	Illuminated lens units		Polycarbonate
	Base unit and top cover		Polycarbonate
	Tube		Painted aluminium
	Fixing plate		Zamak

Presentation : pages 2/48 and 2/49
References : pages 2/52 to 2/54
Dimensions : page 2/55

AS-Interface cabling system
Dedicated components
Illuminated indicator banks type XVB

Electrical characteristics

Rated insulation voltage (Ui)	Conforming to IEC 947-1		**V**	250
Voltage limits	Conforming to IEC 947-5-1		**V**	0.85 to 1.10 Un (Un: nominal voltage)
Consumption	LED unit	Steady	**mA**	≂ 24 V: < 30
		Flashing	**mA**	≂ 24 V: < 40
	Unit with discharge tube (on energisation)		**mA**	≂ 24 V: 5J unit: < 430
	Audible signalling units		**mA**	≂ 12…48 V: < 20 V
Rated impulse withstand voltage	Conforming to IEC 947-1		**kV**	U imp = 4
Bulb type	Illuminated units, steady			Bulbs with BA 15d base fitting, minimum power 5 W, maximum power 10 W
Illuminating power	Units with discharge circuit ("flash" lamp with integral tube)		**cds**	13 (integral high intensity tube) with clear lens unit: 5J tube 26 (integral high intensity tube) with clear lens unit: 10J tube
Audible signalling unit	Continuous or intermittent signal		**dB**	90 at 1 m
	Fundamental frequency		**kHz**	2.8
Terminal referencing	Common to all 5 units			1 terminal referenced "C"
	Depending on number of units			1 or 5 terminals referenced 1 to 5
Connection	Maximum clamping capacity on protected, ready-to-tighten, screw and captive cable clamp terminals		**mm²**	1 x 1.5 with cable end
Frequency of illuminated units	Flashing units		**Hz**	1
	Units with discharge circuit		**Hz**	1

Characteristics specific to the AS-Interface base unit

Supply to components	Via the AS-Interface line		**V**	24…31.6	
	External		**V**	19.2…30 PELV (Protective Extra Low Voltage)	
Current consumption, AS-Interface line	No-load		**mA**	30 (with supply via the AS-Interface line or external supply)	
	Under load		**mA**	250 (with supply via the AS-Interface line), 30 (with external supply)	
Current supplied to the illuminated or audible signalling units	Supply via the AS-Interface line		**mA**	200 max for 1 to 4 units	
	External supply		**A**	0.7 max per unit, 2 max for 4 units	
AS-Interface cabling system profile				S.7.F	
AS-Interface cabling system certification				N° 25701	
Data bits	State of unit diagnostics	Bit value		**0**	**1**
		D0 (Input)		Unit 1: "fault"	Unit 1: "on"
		D1 (Input)		Unit 2: "fault"	Unit 2: "on"
		D2 (Input)		Unit 3: "fault"	Unit 3: "on"
		D3 (Input)		Unit 4: "fault"	Unit 4: "on"
	Control of units	D0 (Output)		Unit 1: "off"	Unit 1: "on"
		D1 (Output)		Unit 2: "off"	Unit 2: "on"
		D2 (Output)		Unit 3: "off"	Unit 3: "on"
		D3 (Output)		Unit 4: "off"	Unit 4: "on"
	Unit parameter setting bits	P0		Unit 1: flashing	Unit 1: steady
		P1		Unit 2: flashing	Unit 2: steady
		P2		Unit 3: flashing	Unit 3: steady
		P3		Unit 4: flashing	Unit 4: steady
Programming of the supply	Supply via the AS-Interface line or external supply			By 2 links (see page 2/55)	
Connection to the AS-Interface line				By M12 connector	

Presentation : pages 2/48 and 2/49
References : pages 2/52 to 2/54
Dimensions : page 2/55

AS-Interface cabling system

Dedicated components

Illuminated indicator banks type XVB

Illuminated lens units and base units

560580

XVB C21A

522039

XVB C2B●

AS-Interface base units + top covers

Base unit attached directly to tube

Description	Type	Reference	Weight kg
Base unit + top cover with M12 side cable entry	AS-Interface	**XVB C21A**	0.190
Base unit + cover with bottom cable entry, 1 m length flying lead with M12 moulded end connector *(1)*	AS-Interface	**XVB C21B**	0.300

Illuminated lens units, steady

Description	Indicator	Colour	Reference	Weight kg
Illuminated lens units for use with XVB C21● base unit	LED supplied ≂ 24 V	Green	**XVB C2B3**	0.150
		Red	**XVB C2B4**	0.150
		Orange	**XVB C2B5**	0.150
		Blue	**XVB C2B6**	0.150
		Clear	**XVB C2B7**	0.150
		Yellow	**XVB C2B8**	0.150

Protected LED

(1) Can only be fitted using support tubes and fixing plate XVB C11.

Presentation : pages 2/48 and 2/49
Characteristics : pages 2/50 and 2/51
Dimensions : page 2/55

AS-Interface cabling system
Dedicated components
Illuminated indicator banks type XVB
Illuminated lens units and base units

522040

XVB C6●●

522041

XVB C8●●

522042

XVB C9●●

Illuminated lens units with “flash” discharge tube

Description	Light source	Colour	Reference	Weight kg
Illuminated lens units For use with base unit XVB C21●	“Flash” discharge tube 5 joules ≂ 24 V	Green	**XVB C6B3**	0.295
		Red	**XVB C6B4**	0.295
		Orange	**XVB C6B5**	0.295
		Blue	**XVB C6B6**	0.295
		Clear	**XVB C6B7**	0.295
		Yellow	**XVB C6B8**	0.295
	“Flash” discharge tube 10 joules ≂ 24 V	Green	**XVB C8B3**	0.305
		Red	**XVB C8B4**	0.305
		Orange	**XVB C8B5**	0.305
		Blue	**XVB C8B6**	0.305
		Clear	**XVB C8B7**	0.305
		Yellow	**XVB C8B8**	0.305

Audible signalling unit

Description	Characteristics	Reference	Weight kg
Buzzer unit 90 dB at 1 m □ Adjustable 70 or 90 dB □ Continuous or intermittent modes (microswitch) □ for use with base unit XVB C21●	≂ 12…48 V	**XVB C9B**	0.170

Presentation : pages 2/48 and 2/49
Characteristics : pages 2/50 and 2/51
Dimensions : page 2/55

AS-Interface cabling system

Dedicated components

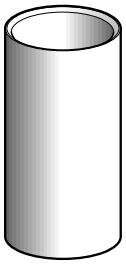
Illuminated indicator banks type XVB

Accessories

821009

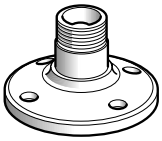
XVB C02

821012



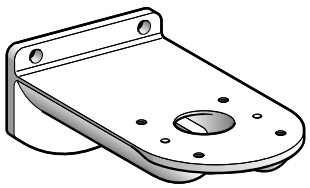
XVB C020

821010



XVB C11

821011



XVB C12

Accessories common to beacons and indicator banks

Description	Characteristics		Sold in lots of	Unit reference	Weight kg
Aluminium support tube, black paint finish	100 mm		1	**XVB C02**	0.100
	400 mm		1	**XVB C03**	0.350
	800 mm		1	**XVB C04**	0.690
Aluminium support tube, unpainted	100 mm		1	**XVB C02A**	0.100
	400 mm		1	**XVB C03A**	0.350
	800 mm		1	**XVB C04A**	0.690
Support tube concealment cover	100 mm		1	**XVB C020**	0.080
	400 mm		1	**XVB C030**	0.305
	800 mm		1	**XVB C040**	0.610
Fixing plate for horizontal surface	For mounting on tube XVB C0●		1	**XVB C11**	0.170
Fixing plate for vertical surface	For direct mounting on base unit or with plate XVB C11 + tube XVB C0●		1	**XVB C12**	0.380
Incandescent bulbs BA 15d base fitting	24 V	10 W	10	**DL1 BLB**	0.090
	24 V	6.5 W	10	**DL1 BEB**	0.090
LEDs BA 15d base fitting	24 V	White	1	**DL1 BDB1**	0.015
		Green	1	**DL1 BDB3**	0.015
		Red	1	**DL1 BDB4**	0.015
		Blue	1	**DL1 BDB6**	0.015
		Yellow-Orange	1	**DL1 BDB8**	0.015

Accessories specific to indicator banks

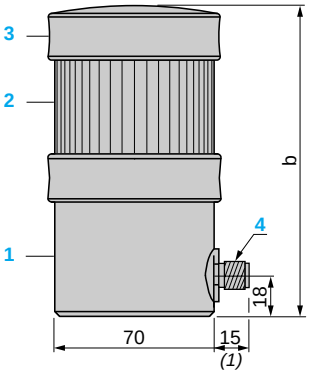
Description	Characteristics	Reference	Weight kg
Cover only	–	**XVB C081**	0.030
Set of coloured markers	6 colours	**XVB C22**	0.001
Set of 5 legend holders	Identification of stacked units on base	**XVB C23**	0.002
Sheet of 85 legends for base unit legend holder (XVB C23)	Identification of stacked units on base	**XVB CY1**	0.005
Sheet of 52 legends	Identification of stacked units on locking ring	**XVB CY2**	0.005
SIS labelling software creation of legends	For English, French, German, Italian, Spanish	**XBY 2U**	0.010

Presentation : pages 2/48 and 2/49
Characteristics : pages 2/50 and 2/51
Dimensions : page 2/55

AS-Interface cabling system
Dedicated components
Illuminated indicator banks type XVB

Illuminated indicator banks type XVB C

Without “flash” discharge tube unit

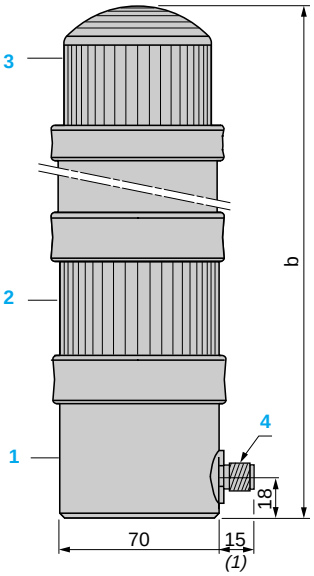


1 + 3 = Base unit XVB C21● + cover
2 Illuminated or audible signalling unit XVB C●●●
3 Cover
4 M12 connector for connection to the AS-Interface cabling system

Number of illuminated or audible signalling units (no “flash”)	b
1	138
2	201
3	264
4	327
5	390

(1) Only for XVB C21A

With “flash” discharge tube unit

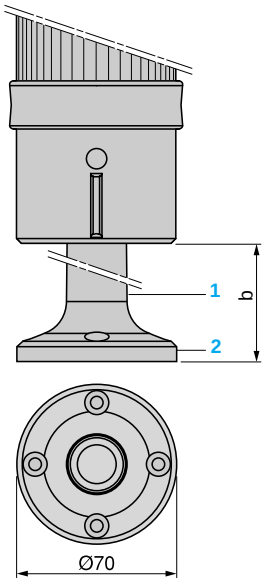


1 + 3 = Base unit XVB C21●
2 Illuminated or audible signalling unit XVB C●●●
3 “Flash” unit XVB C●●●
4 M12 connector for connection to the AS-Interface cabling system

Number of illuminated or audible signalling units other than “flash” tube	b
1	295
2	358
3	421
4	484

(1) Only for XVB C21A

Support tube XVB C0● and fixing plate for horizontal surface XVB C11

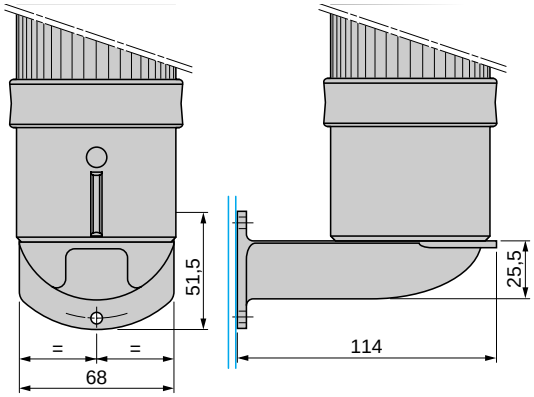


1 Tube XVB C0● Ø 25 mm
2 Fixing plate for horizontal surface XVB C11

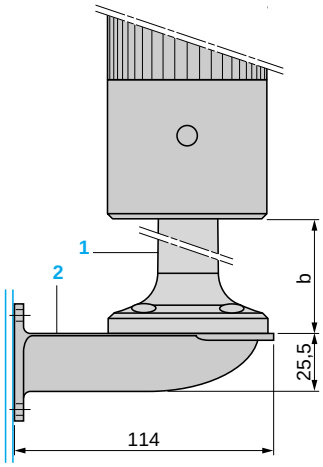
	b
XVB C02	77
XVB C03	377
XVB C04	777

Fixing plate for vertical surface XVB C12

Direct mounting on base unit



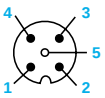
Mounting by means of plate XVB C11 screwed onto tube XVB C0●



1 Tube Ø 25 mm
2 Fixing plate for vertical surface XVB C12

	b
XVB C02	77
XVB C03	377
XVB C04	777

M12 male connectors

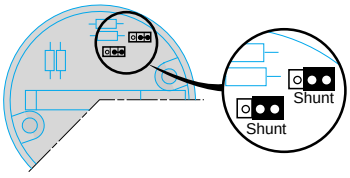


1 *+ AS-Interface supply*
2 *- External supply*
3 *- AS-Interface supply*
4 *+ External supply*
5 *N.C.*

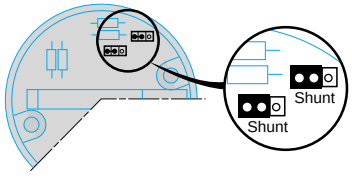
Supply programming

Link positions

Supply via the AS-Interface line



External supply



Presentation : pages 2/48 and 2/49
Characteristics : pages 2/50 and 2/51
References : pages 2/52 to 2/54

Contents

3 - Safety solutions on AS-Interface cabling system

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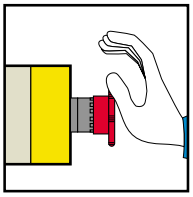
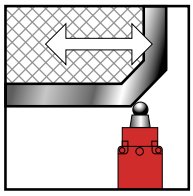
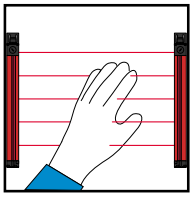
■ AS-Interface “Safety at work” monitors . . . . . *page 3/6*

■ AS-Interface safety interfaces . . . . . *page 3/10*

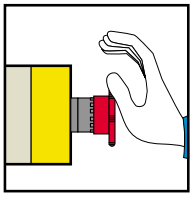
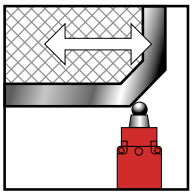
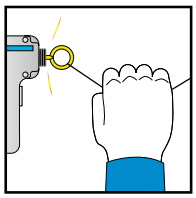
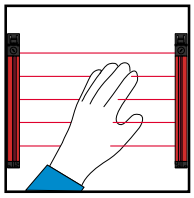
AS-Interface cabling system

Safety solutions on AS-Interface cabling system

Safety monitors and interfaces

Applications		**Safety monitors on AS-Interface cabling system**	
		  	
"AS-Interface safety at work"		Safety is incorporated into the AS-Interface cabling system by adding a monitor and a safety interface connected together with other standard AS-Interface components to the yellow cable	
Functions		Safety applications integrated on the AS-Interface line Emergency stop, limit switch and safety light curtain monitoring	
AS-Interface profile		7.F	
Addressing		With configuration software ASISWIN2	
Conforming to standards	Product	Category 4 conforming to EN 954-1, EN 1088 EN 61496-1 (type 4), EN 1780 EN 60947-6-3	
	Machine assemblies	IEC/EN 60204-1, EN 292, EN 418	
Product certifications		UL, CSA	
Number of circuits	Safety	2 “NO”	2 x 2 N/O
	Additional	1 solid-state output for signalling to PLC	2 solid-state outputs
Display		5 LEDs	8 LEDs
Supply		⎓ 24 V	⎓ 24 V
Type		**ASI SAFEMON●, ASI SAFEMON●B**	
Pages		3/6	

Safety interfaces on AS-Interface cabling system

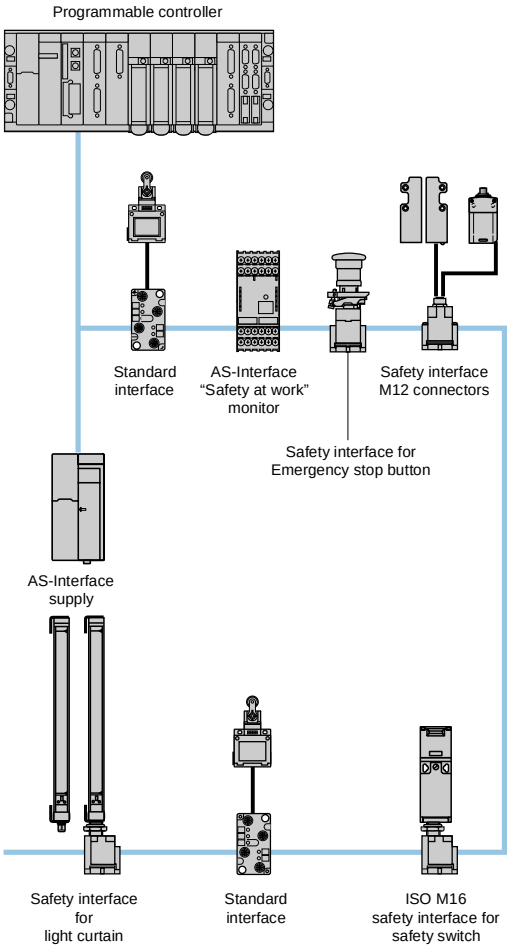
Safety is incorporated into the AS-Interface cabling system by adding a monitor and a safety interface connected together with other standard AS-Interface components to the yellow cable

Emergency stop interfaces		Interfaces for safety products		
Metal	Plastic	1 M12 input	2 M12 inputs	1 M16 ISO input
0.B.F.F	0.B.F.F	0.B.F.F	0.B.F.F	0.B.F.F
Infrared with ASI-TERV2 adjustment console + ASI-TERIR1 cable	Infrared with ASI-TERV2 adjustment console + ASI-TERIR1 cable	Infrared with ASI-TERV2 adjustment console + ASI-TERIR1 cable	Infrared with ASI-TERV2 adjustment console + ASI-TERIR1 cable	Infrared with ASI-TERV2 adjustment console + ASI-TERIR1 cable
EN 1088, EN 61496-1, EN 61947-5-3, EN 574				
IEC/EN 60204-1, EN 292, EN 418				
UL, CSA				
–		–	–	–
–		–	–	–
2 LEDs		2 LEDs	2 LEDs	2 LEDs
On AS-Interface line		On AS-Interface line	On AS-Interface line	On AS-Interface line
ASI SSLB●		**ASI SSLC●**		**ASI SSLLS**
3/10				

AS-Interface cabling system

Safety solutions on AS-Interface cabling system

AS-Interface “Safety at work” monitors



Operating principle

AS-Interface, the recognised cabling system for sensors and actuators, has changed. Standard process information and information relating to safety can now be transmitted over the same cable. Capable of managing safety functions up to level 4 of standard EN-954-1, the AS-Interface "Safety at work" system meets the needs of the most common safety applications, such as:

- monitoring of Emergency stops with instantaneous break contacts (stop category 0),
- monitoring of Emergency stops with delayed break contacts (stop category 1),
- monitoring of switches with and without interlocking,
- monitoring of light curtains, etc.

Parameters for options relative to the selected safety function (such as, for example, start button monitoring) may be set for all pre-defined, certified functions.
Safety is incorporated into the AS-Interface cabling system by adding a safety monitor and safety interfaces connected together with other standard AS-Interface components on the yellow cable.
Safety information is exchanged only between the safety monitor and the safety interfaces. This is transparent for the other standard AS-Interface components.
Based on this principle, AS-Interface cabling systems that are already nstalled can be updated with safety functions without having to replace the existing components (masters, input/output interfaces, power supplies, etc.). Safety circuits are diagnosed readily, and with no additional wiring, by the standard AS-Interface cabling system master communicating with the safety monitor(s) via the yellow cable.

The ASI SWIN2 configuration software is included on the Safety Suite V.0 CD-Rom.
The AS-Interface “Safety at work” system is configured by means of the Windows-based ASI SWIN2 software. A library of pre-defined and certified safety functions is made available by the software and the user can graphically select the desired safety functions, at the last minute, by the “Drag and drop” method in the configuration software. Knowledge of a programming language or specific tools is not necessary to set up the system. The configuration is loaded into the safety monitor(s) by means of a PC by carrying out a secure serial transmission and using the parameter setting connector on the monitor front panel.

To meet different safety requirements, the As-Interface "Safety and work" monitor is available in two versions:

- monitors for basic monitoring of safety devices,
- monitors for enhanced monitoring of safety devices.

As-Interface "Safety at work" monitors for basic and enhanced monitoring are available with:

- 1 safety output with 2 contacts or,
- 2 independent safety outputs with 2 x 2 contacts.

In addition to safety outputs with volt-free contacts, As-Interface "Safety at work" monitors are equipped, depending on the model, with one or two solid-state signalling outputs and front panel lights indicating the status of the system and of the monitoring circuits. To monitor more safety functions simultaneously or to stop several safety circuits at different locations, a greater number of safety monitors may be used in an AS-Interface cabling system.
The safety interfaces are connected directly to the yellow cable via an insulation displacement connector. In addition to the possibility of self-addressing by the AS-Interface cabling system master and manual addressing by the console, they can be addressed directly by infrared means on the front panel of products. Their compact size provides the possibility of direct attachment to control devices such as, for example, Emergency stop buttons or switches. In addition to interfaces that can be attached to products, versions with 1 or 2 M12 connectors are also available.

AS-Interface cabling system

Safety solutions on AS-Interface cabling system

AS-Interface “Safety at work” monitors

Monitoring functions

	AS-Interface “Safety at work” monitors	
	For basic monitoring of safety devices ASI SAFEMON1/2	**For enhanced monitoring of safety devices ASI SAFEMON●B**
Monitoring of safety devices	■ Emergency stops ■ Safety switches ■ Light curtains	■ Emergency stops ■ Safety switches ■ Light curtains ■ Button for validation of linked devices ■ Conditionally dependent devices ■ Devices with bouncing contacts
Logic functions	■ “OR” (up to 2 devices)	■ “OR” (up to 6 devices) ■ “AND” ■ “FLIP FLOP” ■ On-delay ■ Off-delay ■ “PULSE” at positive edge
External device monitoring (EDM)	■ Feedback loop	■ Feedback loop ■ Feedback loop monitoring over the As-Interface cabling system
Starters	■ Automatic starting ■ Starting monitored by the AS-Interface cabling system slave ■ Starting monitored by connection to the monitor ■ Starting monitored by the safety interface	■ Automatic starting ■ Starting monitored by the AS-Interface cabling system slave ■ Starting monitored by connection to the monitor ■ Starting monitored by the safety interface
Output devices	■ Stop category 1 ■ Stop category 0	■ Stop category 1 ■ Stop category 0

Characteristics

AS-Interface “Safety at work” monitor type			**ASI SAFEMON1, ASI SAFEMON1B**	**ASI SAFEMON2, ASI SAFEMON2B**
Maximum utilisation category of product	(Conforming to EN 954-1)		Category 4	Category 4
AS-Interface profile			7.F	7.F
Consumption on the AS-Interface line		**mA**	44	44
Type of protection (suitable only for use in electronic rooms/ electrical cabinets with minimum IP 54 degree of protection)			IP 20	IP 20
Operating voltage Ub		**V**	⎓ 24 ± 15 %	⎓ 24 ± 15 %
Rated operating current		**mA**	150	200
Response duration		**ms**	< 40	< 40
Pick-up delay		**s**	< 10	< 10
Inputs	“Start”		Optoelectronic coupler input (active when High), input current about 10 mA at ⎓ 24 V	
	"Protection control (EDM)"		Optoelectronic coupler input (active when High), input current about 10 mA at ⎓ 24 V	
Outputs	“Safety on” indication		PNP transistor output, 200 mA	
	Safety		Volt-free N/O contacts, max. contact load	
Fuse protection			External with max. of 4 A MT	
Operating temperature range		**°C**	- 20…+ 60	
Storage temperature		**°C**	- 30…+ 70	

***Note**: the impedance of a safety monitor must be taken into account when selecting the number of interfaces on the AS-Interface cabling system, even if it is used in “watchdog” mode.*

The technical details of the system are described in the Schneider Electric AS-Interface guide, in the safety monitor hardware and software manuals and in the configuration software under "telemecanique.com".

AS-Interface cabling system

Safety solutions on AS-Interface cabling system

AS-Interface “Safety at work” monitors

ASI SAFEMON●

References

AS-Interface “Safety at work” monitors

Type	Number of safety circuits	Solid-state outputs to PLC	Supply	Reference	Weight kg
For basic monitoring of safety devices	2 N/O	1	⎓ 24 V	**ASI SAFEMON1**	0.300
	2 x 2 N/O	2	⎓ 24 V	**ASI SAFEMON2**	0.300
For enhanced monitoring of safety devices.	2 N/O	1	⎓ 24 V	**ASI SAFEMON1B**	0.300
	2 x 2 N/O	2	⎓ 24 V	**ASI SAFEMON2B**	0.300

Safety Suite V.0 configuration software

Description	Application	Language	Reference	Weight kg
AS-Interface “Safety at work” configuration software with hardware and software user guide supplied on CD-Rom	Safety monitors for basic monitoring of safety devices ASI SAFEMON1/2 Safety monitors for enhanced monitoring of safety devices ASI SAFEMON●B	FR/EN/DE/IT/ES/PT	**ASI SWIN2**	0.020

Adjustment terminal

Description	Application	Reference	Weight kg
Adjustment terminal (device operating on LR6 battery)	Infrared addressing and diagnosis of AS-Interface V2-1 interfaces	**ASI TERV2**	0.500

Accessories

Description	Function	Reference	Weight kg
Cables	For RS 232 parameter setting	**ASI SCPC**	0.100
	For transfer between 2 monitors	**ASI SCM**	0.500
Cable	For infrared addressing and diagnosis of AS-Interface V2-1 interfaces For connection to the ASI TERV2 terminal	**ASI TERIR1**	0.570

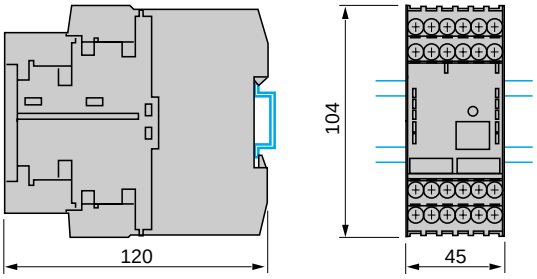
AS-Interface cabling system

Safety solutions on AS-Interface cabling system

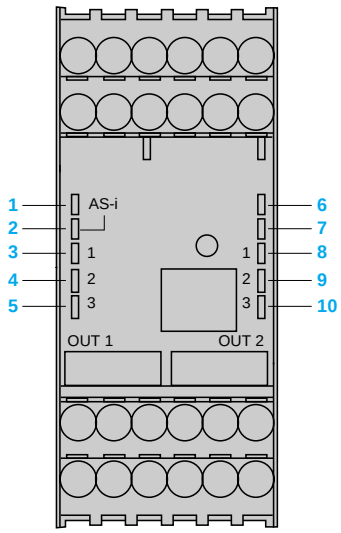
AS-Interface “Safety at work” monitors

Dimensions

ASI SAFEMON●, ASI SAFEMON●B



Key to LEDs



ASI SAFEMON1, ASI SAFEMON1B

1 AS-Interface line supply (green)
2 AS-Interface line fault (red)
3 Signal for restarting (yellow)
4 Safety outputs closed (green)
5 Safety outputs open (red) or output error (flashing red)

ASI SAFEMON2, ASI SAFEMON2B

Output 1

1 AS-Interface line supply (green)
2 AS-Interface line fault (red)
3 Signal for restarting (yellow)
4 Safety outputs closed (green)
5 Safety outputs open (red) or output error (flashing red)

Output 2

6 AS-Interface line supply (green)
7 AS-Interface line fault (red)
8 Signal for restarting (yellow)
9 Safety outputs closed (green)
10 Safety outputs open (red) or output error (flashing red)

AS-Interface cabling system

Safety solutions on AS-Interface cabling system

Safety interfaces

Operating principle

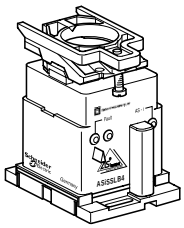
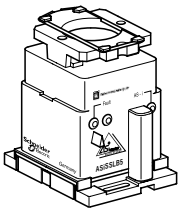
Safety is incorporated into the AS-Interface cabling system by adding a safety monitor and safety interfaces connected together with other standard AS-Interface components on the yellow cable.

Safety information is exchanged only between the safety monitor and the safety interfaces. This is transparent for the other standard AS-Interface components. Based on this principle, AS-Interface cabling systems that are already installed can be updated with safety functions without having to replace the existing components (masters, input/output interfaces, power supplies, etc.).

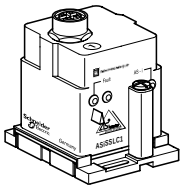
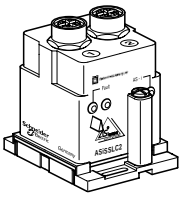
Safety circuits are diagnosed readily, and with no additional wiring, by the standard AS-Interface cabling system master communicating with the safety monitor via the yellow cable.

Presentation

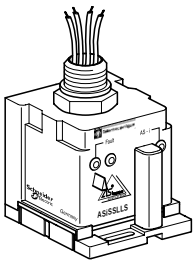
Interfaces for Harmony Ø 22 mm Emergency stop

Metal	Plastic
	

Interfaces for products with M12 outlets

1 x M12 outlet	2 x M12 outlets
	

Interface for products with ISO M16 or M20 outlets



AS-Interface cabling system

Safety solutions on AS-Interface cabling system

Safety interfaces

Safety interface type			ASI SSLB4	ASI SSLB5	ASI SSLC1	ASI SSLC2	ASI SSLLS
Environment							
Maximum utilisation category of product			Category 4 conforming to EN 954-1				
Degree of protection	Conforming to IEC 529		IP 20	IP 20	IP 67	IP 67	IP 67
AS-Interface profile			0.B.F.F.				
Addressing			Infrared with adjustment terminal				
Ambient air temperature	Operation	**°C**	- 10…+ 55				
	Storage	**°C**	- 25…+ 85				
Mechanical characteristics							
Mechanical durability	In thousands of operating cycles		0.3	0.3	–	–	–
Shock resistance			10 gn	10 gn	10 gn	10 gn	10 gn
Vibration resistance			5 gn	5 gn	5 gn	5 gn	5 gn
Electrical characteristics							
Supply via the AS-Interface line	Voltage	**V**	Via AS-Interface ⎓ 24				
	Voltage limits		- 15…+ 15 **%**				
Consumption		**W**	1.2				
Consumption on the AS-Interface line		**mA**	45				
Connection to AS-Interface line			Insulation displacement connector (IDC)				

***Note**: the technical details of the system are described in the Schneider Electric AS-Interface guide, in the safety monitor hardware and software manuals and in the configuration software under "telemecanique.com".*

AS-Interface cabling system

Safety solutions on AS-Interface cabling system

Safety interfaces

580116

ASI SSLB4 + ZB4 BS844

580117

ASI SSLB5 + ZB5 AS844

580118

ASI SSLC1

580119

ASI SSLC2

580120

ASI SSLLS

References

Interfaces for Ø 22 mm Emergency stop

Type	Contact type	Connection to AS-Interface line	Reference	Weight kg
Metal	N/C + N/C	Insulation displacement connector (IDC)	**ASI SSLB4**	0.080
Plastic	N/C + N/C	Insulation displacement connector (IDC)	**ASI SSLB5**	0.040

Interfaces for products with connector outlets

Type	Number of contacts	Connection to AS-Interface line	Reference	Weight kg
1 x M12 entry	2	Insulation displacement connector (IDC)	**ASI SSLC1**	0.040
2 x M12 entries *(1)*	2	Insulation displacement connector (IDC)	**ASI SSLC2**	0.050

Interface for products with ISO outlets

Type	Number of contacts	Connection to AS-Interface line	Reference	Weight kg
1 x ISO M16 entry *(2)*	2	Insulation displacement connector (IDC)	**ASI SSLLS**	0.040

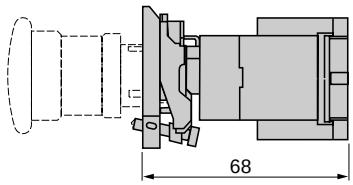
Accessories

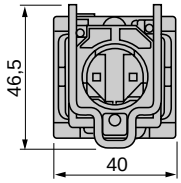
Type	Material	Unit reference	Weight kg
Adapter for ISO M20 (sold in lots of 5)	Metal	**DE9 RI2016**	0.040
"Mushroom-head" pushbuttons Ø 40, turn to release	Metal	**ZB4 BS844** *(3)*	0.060
	Plastic	**ZB5 AS844** *(3)*	0.050

(1) Only use extension connectors XZ CP1541L●.
(2) For ISO M20 product, see adapter.
(3) For other "mushroom head" pushbuttons, please consult our catalogue "Components for Human-Machine interfaces".

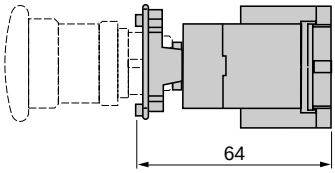
Dimensions

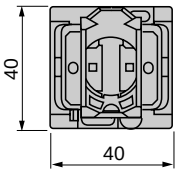
ASI SSLB4



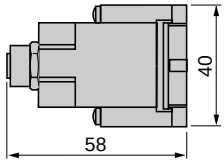


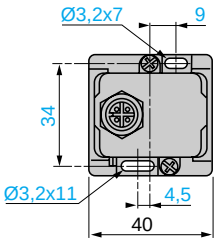
ASI SSLB5



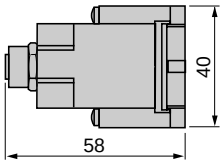


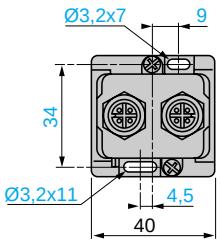
ASI SSLC1



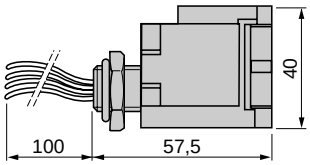


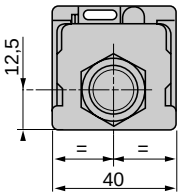
ASI SSLC2





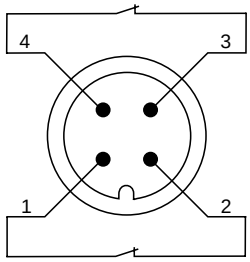
ASI SSLLS





Connections

ASI SSLC1



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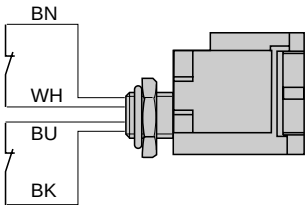
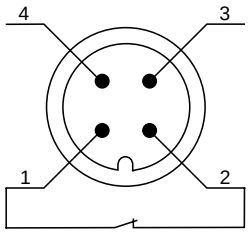
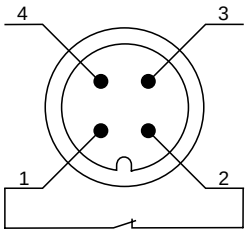


ASI SSLC2





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- Extension cables with M12 male and
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- Phaseo regulated switch mode power supplies . . . . . *page 4/17*
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AS-Interface cabling system
Installation system

Description	Cables and repeaters	Accessories and tap-offs	Connectors and extension cables	Power supplies	Insulation control relay
Degree of protection	IP 67	IP 54/IP 67	IP 67	IP 20	IP 20
Functions	Yellow or black cables 2 x 1.5 mm^2 Repeater allowing an AS-Interface link to be extended by 100 m	Tap-off for 1 or 2 AS-Interface cables T connectors	Connectors and extension cables for connection of sensors/ actuators	Regulated power supplies, with or without insulation control relay	Detects and signals any earth fault on either of the 2 polarities of the AS-Interface cable
Connection to the AS-Interface cable	IDC (Insulation Displacement Connector)	IDC (Insulation Displacement Connector)	M12 connector	By screw clamp terminal block	By removable screw clamp terminal block
Characteristics	Cable length: 20; 50; 100 m	Cable length: 0.3; 0.6; 1; 2; 5 m	Cable length: 0.5; 1; 2 m	Output voltage 30 V or 30 V to 124 V	Supply voltage: 30 V
Type	**XZ CB ●● and ASI RPT01**	**XZ CG ●● and ASI DCP●●**	**XZ ●●**	**ASI ABL●●**	**RM0 PAS101**
Pages	4/4 and 4/5	4/6	4/8 to 4/13	4/17	4/23

Twido master module	Master module for Micro PLCs	Master module for Premium PLCs	Master module for Quantum PLCs	Fipio gateway module	ModBus/ModBus Plus gateway module
IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Master module capable of managing digital or analogue devices Specification V2.1	Master module capable of managing digital devices Specification V1	Master module capable of managing digital or analogue devices Specification V2.1	Master module capable of managing digital devices Specification V1	Allows connection between the Fipio bus and the AS-Interface system Specification V1	Allows connection between the ModBus/ ModBus Plus buses and the AS-Interface system Specification V1
By removable screw clamp terminal block	By screw clamp terminal block	SUB-D3 male connector	SUB-D3 male connector	By removable screw clamp terminal block	By screw clamp terminal block
Number of devices: - 62 digital - 7 analogue	Number of devices: 31 digital	Number of devices: 62 maximum, depending on the equipment profiles	Number of devices: 31 digital	Number of devices: 31 digital	Number of devices: 31 digital
TWD NOI 10M3	**TSX SAZ 10**	**TSX SAY 1000**	**140 EIA 921 00**	**TBX SAP 10**	**XZ ML●●**
4/25	4/27	4/29	4/32	4/35	4/37

AS-Interface cabling system
Installation system
AS-Interface cables

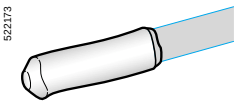
Flat cables and accessories

The special profile of these 2-core flat cables eliminates the risk of polarity reversal when connecting. Connections to the cables are made by IDCs (Insulation Displacement Connectors), see connection accessories.
The sheath material self-seals the holes made by the IDC when the connector is removed.
Degree of protection IP 67.
Ambient air temperature:
- ■ standard cable:
- □ operation: 25…+ 85 °C,
- □ storage: - 40…+ 85 °C,
- ■ TPE cable (oil and vapour resistant):
- □ for operation with cable flexing: - 30…+ 105 °C,
- □ for non-flexing operation or storage: - 40…+ 105 °C.

XZ CB1●●0●

Description	Sheath colour	Length	Type of cable	Reference	Weight kg
Flat cable 2 x 1.5 mm² Ue ≤ 48 V	Yellow (for AS-Interface)	20 m	Standard	**XZ CB10201**	1.400
			TPE	**XZ CB10201H**	1.400
		50 m	Standard	**XZ CB10501**	3.500
			TPE	**XZ CB10501H**	3.500
		100 m	Standard	**XZ CB11001**	7.000
			TPE	**XZ CB11001H**	7.000
	Black (for separate ⎓ 24 V supply)	20 m	Standard	**XZ CB10202**	1.400
			TPE	**XZ CB10202H**	1.400
		50 m	Standard	**XZ CB10502**	3.500
			TPE	**XZ CB10502H**	3.500
		100 m	Standard	**XZ CB11002**	7.000
			TPE	**XZ CB11002H**	7.000

XZ CE40

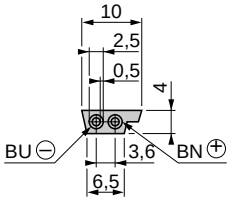


ASI 67FACC2

Description	Application	Sold in lots of	Unit reference	Weight kg
Cable gland protective seal	For use with flat cable and 11 mm cable gland (DIN Pg 11)	10	**XZ CE40**	0.001
Heat shrinkable cable end	For achieving IP 67 degree of protection	10	**ASI 67FACC2**	0.002

Dimensions

Cables XZ CB1●●●●

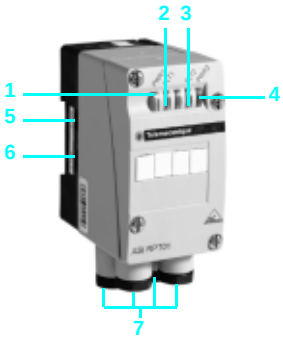


AS-Interface cabling system
Installation system
Repeaters

Presentation

The repeater allows an AS-Interface line to be extended by 100 m (the maximum length of the line becomes 300 m).
Direct connection to the flat AS-Interface cable by insulation displacement connectors (IDCs).
Galvanic isolation between the segments.

Description



Repeater ASI RPT01 comprises:
1 A PWR1 LED (green): power ON, AS-Interface line nº 1
2 An FLT1 LED (red): communication fault on AS-Interface line nº 1
3 An FLT2 LED (red): communication fault on AS-Interface line nº 2
4 A PWR2 LED (green): power ON, AS-Interface line nº 2
5 AS-Interface cable nº 2 connection
6 AS-Interface cable nº 1 connection
7 Four unused blanking plugs.

Characteristics

Ambient air temperature		Operation: - 10 °C…+ 55 °C Storage: - 25 °C…+ 75 °C
Degree of protection		IP 65
Material		Plastic
Connection		To yellow AS-Interface cable
Power supply		Via the AS-Interface cable
Current consumption		60 mA per AS-Interface segment (120 mA total)
Operational voltage		Depending on AS-Interface specification (⎓ 18.5…31.6 V)
Isolation		Galvanic isolation between the segments
Diagnostic signalling	AS-Interface power ON	One green LED per segment
	Communication fault	One red LED per segment

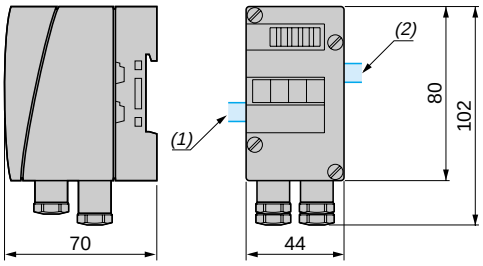
References

522109

ASI RPT01

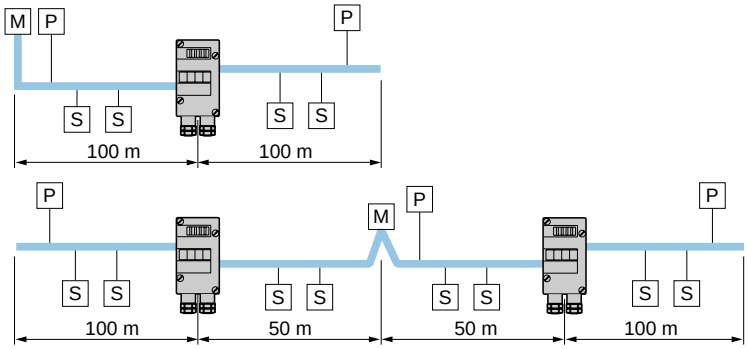
Description	Application	Reference	Weight kg
Repeater	For extending an AS-Interface line by 100 m	**ASI RPT01**	0.190

Dimensions



(1) AS-Interface cable nº 1 (master side)
(2) AS-Interface cable nº 2 (extension side)

Connections

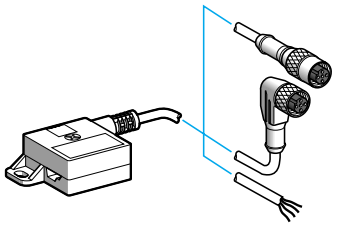


AS-Interface cabling system

Installation system

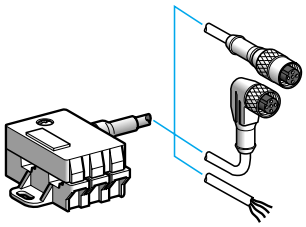
Connection accessories

DF521832



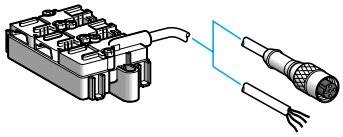
XZ CG012●

DF521833



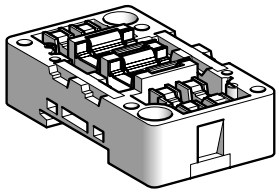
XZ CG014●

DF521834



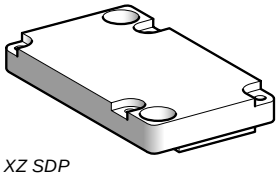
XZ DCP●

806424



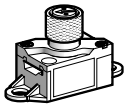
XZ SDE1113

806428



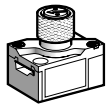
XZ SDP

806440



XZ CG0120

806439



XZ CG0220

Accessories for connection to AS-Interface flat cables

Tap-offs for connection of AS-Interface components to flat cables

Connection to flat cables by IDC (Insulation Displacement Connector). Ue ≤ 40 V, Ie ≤ 2 A.
Ambient air temperature: - 25…+ 70 °C (operation), - 40…+ 85 °C (storage).

Description	Connection to the AS-Interface component	Cable length	Fixing	Reference	Weight kg
Tap-offs for connection to a flat cable for AS-Interface (yellow) Degree of protection IP 54	Flying lead with 5-contact female straight M12 end connector (2 x 0.34 mm² cable)	0.6 m	Screw	**XZ CG01205D**	0.090
		1 m	Screw	**XZ CG0121D**	0.130
	Flying lead with 5-contact female elbowed M12 end connector (2 x 0.34 mm² cable)	0.6 m	Screw	**XZ CG01205C**	0.090
		1 m	Screw	**XZ CG0121C**	0.130
	Cable with stripped ends for terminal block (2 x 0.34 mm² cable) Brown wire AS-i ⊕ Blue wire: AS-i ⊖	2 m	Screw	**XZ CG0122**	0.215
Tap-offs for connection to two flat cables: - 1 for AS-Interface (yellow) - 1 for the separate supply (black) Degree of protection IP 54	Flying lead with 5-contact female straight M12 end connector (4 x 0.34 mm² cable)	0.3 m	Screw	**XZ CG01403D**	0.140
		2 m	Screw	**XZ CG0142D**	0.180
	Flying lead with 5-contact female elbowed M12 end connector (4 x 0.34 mm² cable)	0.3 m	Screw	**XZ CG01403C**	0.140
		2 m	Screw	**XZ CG0142C**	0.180
	Cable with stripped ends for terminal block (4 x 0.34 mm² cable) Brown wire AS-i ⊕ Blue wire: AS-i ⊖ White wire: 0 V Black wire: + 24 V	2 m	Screw	**XZ CG0142**	0.265
Tap-offs for connection to two flat cables: - 1 for AS-Interface (yellow) - 1 for the separate supply (black) Degree of protection IP 67	Flying lead with 5-contact female straight M12 end connector (4 x 0.34 mm² cable)	0.3 m	Screw	**ASI DCPM12D03**	0.150
		2 m	Screw	**ASI DCPM12D20**	0.200
	Cable with stripped ends for terminal block (4 x 0.34 mm² cable) Brown wire AS-i ⊕ Blue wire: AS-i ⊖ White wire: 0 V Black wire: + 24 V	2 m	–	**ASI DCPFIL20**	0.200
		5 m	–	**ASI DCPFIL50**	0.350

Tap-offs using connection bases

Description	Type and number of connectable cables	Connection to cable	Reference	Weight kg
Connection base for flat cable	2 flat cables for AS-Interface (yellow) or 2 flat cables for separate supply (black) Ie ≤ 2 A	By IDC (Insulation Displacement Connector)	**XZ SDE1113**	0.070

Description	For use with	Reference	Weight kg
Cover	For connection base XZ SDE1113	**XZ SDP**	0.030

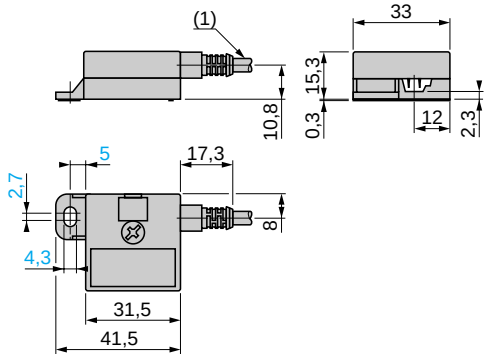
T connectors

Description	Connection to the AS-Interface sensor or actuator	Fixing	Reference	Weight kg
T connectors for connection to a flat cable for AS-Interface (yellow) Degree of protection IP 67	By 5-contact female M12 connector	Screw	**XZ CG0120**	0.015
		Without	**XZ CG0220**	0.015

AS-Interface cabling system
Installation system
Connection accessories

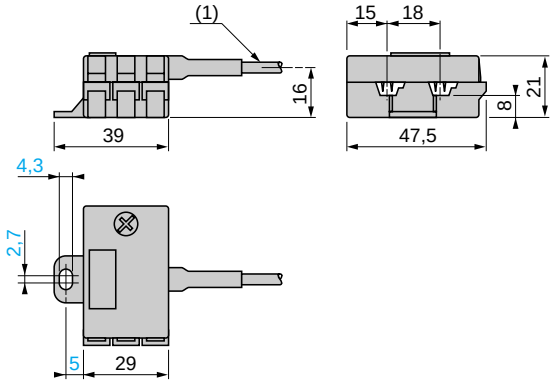
Dimensions

Tap-offs XZ CG012●●



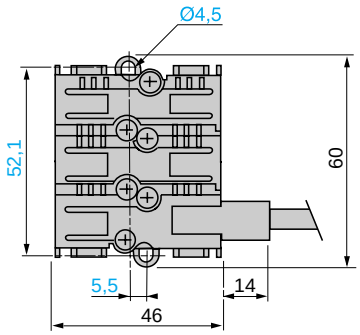
(1) Cable length 0.6 or 2 m.
Cable with stripped ends (brown: AS-i ⊕, blue: AS-i ⊖) or fitted with an M12 end connector

XZ CG014●●

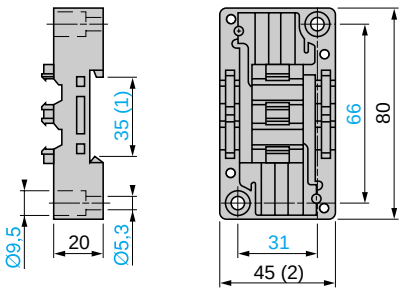


(1) Cable length 0.3 or 2 m.
Cable with stripped ends (brown: AS-i ⊕, blue: AS-i ⊖, white: 0 V, black: + 24 V) or fitted with an M12 end connector

Tap-offs for connection to two flat cables ASI DCP●

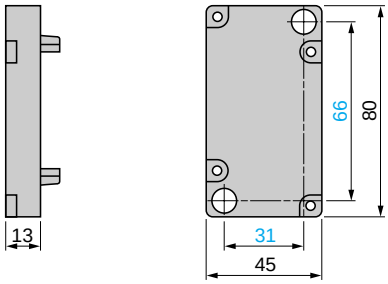


Connection base XZ SDE1113

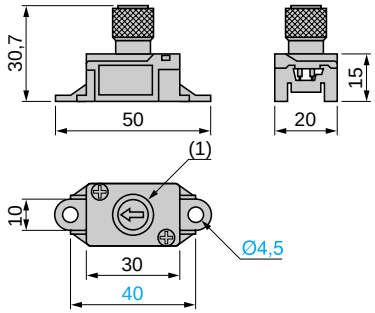


(1) Mounting on ⊥ rail
(2) When mounting side-by-side, leave a clear space of at least 1 mm between the bases.

Cover for connection base XZ SDP

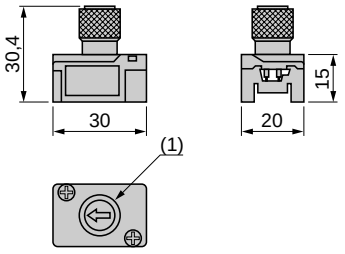


T connectors XZ CG0120



(1) Connector adjustable to 2 positions, at 90°.

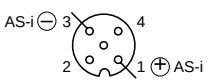
XZ CG0220



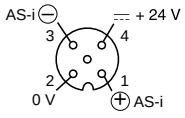
(1) Connector adjustable to 2 positions, at 90°.

Connections

M12 connectors on T connectors XZ CG0●20 and tap-offs XZ CG012●



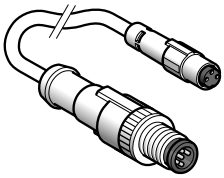
M12 connectors on tap-offs XZ CG014●● and ASI DCPFIL●0

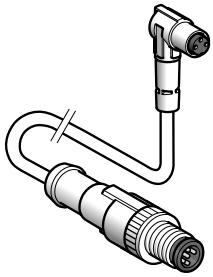


AS-Interface cabling system

Installation system

Extension cables with M12 male, female for terminal connections and Ø 8 mm female connectors

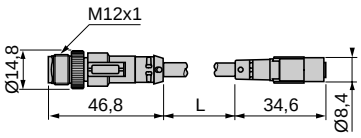




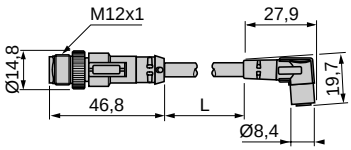
Male connector type		M12, 3-pin, straight	
Female connector type		Ø 8 mm, 3-pin, straight	Ø 8 mm, 3-pin, elbowed
References			
PUR cable, colour black	L = 1 m	**XZ CR1501040G1**	**XZ CR1502040G1**
	L = 2 m	**XZ CR1501040G2**	**XZ CR1502040G2**
Weight (kg)		0.050 (L = 1 m), 0.080 (L = 2 m)	
Characteristics			
Type of connection		Male: screw threaded. Female: clip *(1)*	
Degree of protection *(2)*		IP 67	
Ambient air temperature		- 35…+ 90 °C	
Conductor c.s.a.		3 x 0.34 mm²	
Cable diameter		5.2 mm	
Nominal voltage		∿ 60 V, ⎓ 75 V	
Nominal current		4 A	
Contact resistance		≤ 5 mΩ	

Dimensions

XZ CR1501040G●



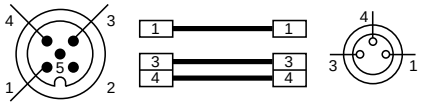
XZ CR1502040G●



L = 1 or 2 m

Connections

XZ CR1501040G●, XZ CR1502040G●

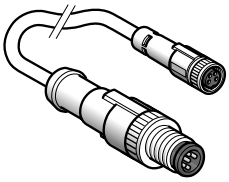


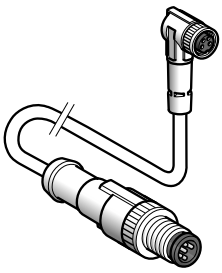
(1) Clip together connector, without locking.
(2) Degree of protection with connectors correctly clipped together and with clamping rings correctly tightened, on screw threaded versions.

AS-Interface cabling system

Installation system

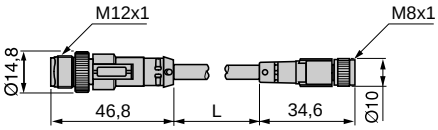
Extension cables with M12 male and M8 female connectors



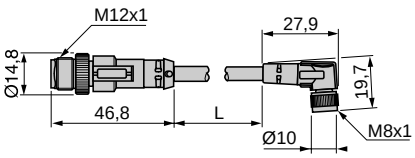


M12, 3-pin, straight		M12, 4-pin, straight	
M8, 3-pin, straight	M8, 3-pin, elbowed	M8, 4-pin, straight	M8, 4-pin, elbowed
XZ CR1509040H1	**XZ CR1510040H1**	**XZ CR1509041J1**	**XZ CR1510041J1**
XZ CR1509040H2	**XZ CR1510040H2**	**XZ CR1509041J2**	**XZ CR1510041J2**
0.050 (L = 1 m), 0.080 (L = 2 m)		0.055 (L = 1 m), 0.090 (L = 2 m)	
Male and female: screw threaded			
IP 67			
- 35…+ 90 °C			
3 x 0.34 mm²		4 x 0.34 mm²	
5.2 mm			
∿ 60 V, ⎓ 75 V			
4 A			
≤ 5 mΩ			

XZ CR1509040H●, XZ CR1509041J●

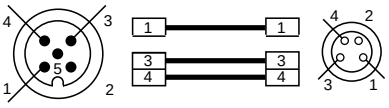


XZ CR1510040H●, XZ CR1510041J●

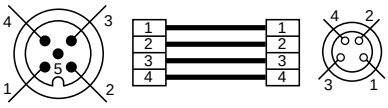


L = 1 or 2 m

XZ CR1509040H●, XZ CR1510040H●



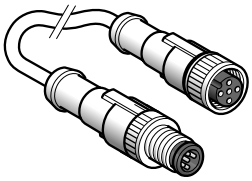
XZ CR1509041J●, XZ CR1510041J●

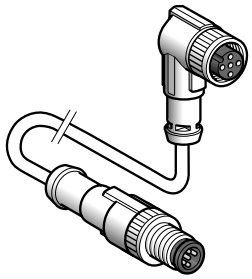


AS-Interface cabling system

Installation system

Extension cables with M12 male and M12 female connectors

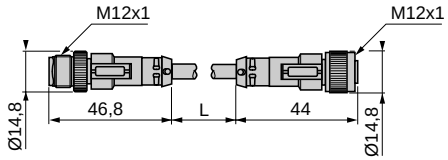




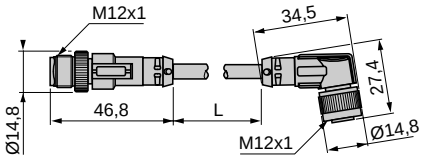
Male connector type		M12, 3-pin, straight			
Female connector type		M12, 3-pin, straight	M12, 3-pin, elbowed	M12, 3-pin, straight	M12, 3-pin, elbowed
References					
PUR cable, colour black	L = 1 m	**XZ CR1511040A1**	**XZ CR1512040A1**	**XZ CR1511040E1**	**XZ CR1512040E1**
	L = 2 m	**XZ CR1511040A2**	**XZ CR1512040A2**	**XZ CR1511040E2**	**XZ CR1512040E2**
Weight (kg)		0.065 (L = 1 m), 0.095 (L = 2 m)			
Characteristics					
Type of connection		Male and female: screw threaded			
Degree of protection *(1)*		IP 67			
Ambient air temperature		- 35…+ 90 °C			
Conductor c.s.a.		3 x 0.34 mm² (black)			
Cable diameter		5.2 mm			
Nominal voltage		∼ 250 V, ⎓ 300 V			
Nominal current		4 A			
Contact resistance		≤ 5 mΩ			

Dimensions

XZ CR1511040A●, XZ CR1511040E●



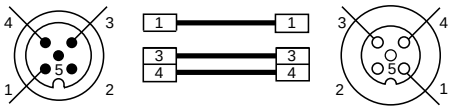
XZ CR1512040A●, XZ CR1512040E●



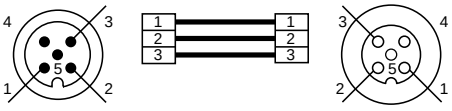
L = 1 or 2 m

Connections

XZ CR1511040A●, XZ CR1512040A●



XZ CR1511040E●, XZ CR1512040E●

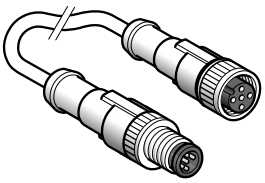


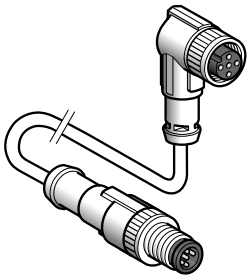
(1) Degree of protection with clamping ring correctly tightened.

AS-Interface cabling system

Installation system

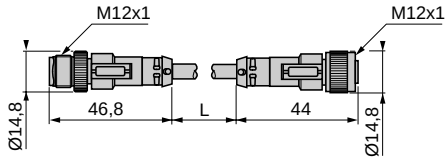
Extension cables with M12 male and M12 female connectors



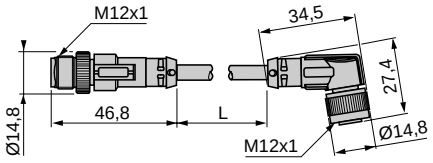


M12, 5-pin, straight		M12, 4-pin, straight		M12, 3-pin, straight	
M12, 5-pin, straight	M12, 5-pin, elbowed	M12, 4-pin, straight	M12, 4-pin, elbowed	M12, 3-pin, straight	M12, 3-pin, elbowed
XZ CR1511064D1	**XZ CR1512064D1**	**XZ CR1511041C1**	**XZ CR1512041C1**	**XZ CR1511062B1**	**XZ CR1512062B1**
XZ CR1511064D2	**XZ CR1512064D2**	**XZ CR1511041C2**	**XZ CR1512041C2**	**XZ CR1511062B2**	**XZ CR1512062B2**
0.080 (L = 1 m), 0.130 (L = 2 m)		0.065 (L = 1 m), 0.095 (L = 2 m)			
Male and female: screw threaded					
IP 67					
- 35…+ 90 °C					
4 x 0.34 mm² + 1 x 0.5 mm²		4 x 0.34 mm²		3 x 0.5 mm²	
5.9 mm		5.2 mm		5.2 mm	
∼ 30 V, ⎓ 36 V		∼ 250 V, ⎓ 300 V		∼ 30 V, ⎓ 36 V	
4 A					
≤ 5 mΩ					

XZ CR1511064D●, XZ CR1511041C●, XZ CR1511062B●

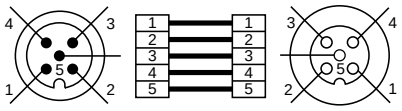


XZ CR1512064D●, XZ CR1512041C●, XZ CR1512062B●

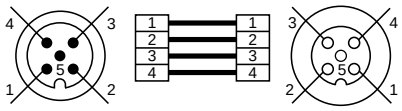


L = 1 or 2 m

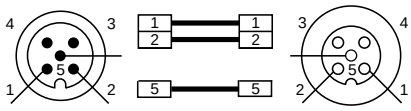
XZ CR1511064D●, XZ CR1511064D●



XZ CR1511041C●, XZ CR1512041C●



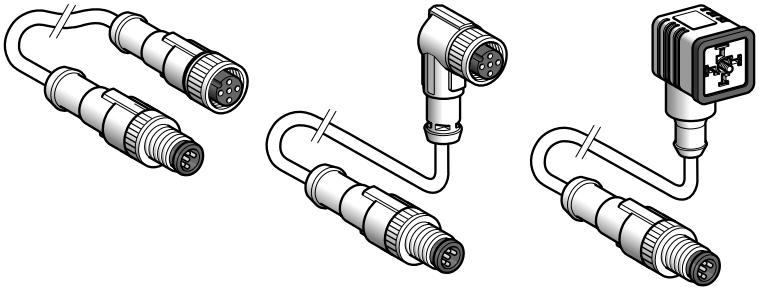
XZ CR1511062B● ,XZ CR1512062B●



AS-Interface cabling system

Installation system

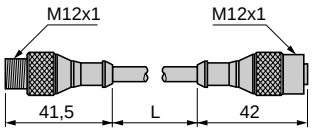
Extension cables with M12 male, M12 female or DIN 43650 A connectors



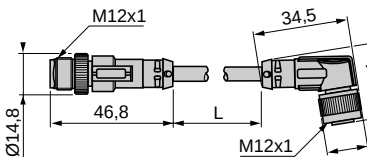
Male connector type		M12, 3-pin, straight		
Female connector type		M12, 3-pin, straight	M12, 3-pin, elbowed	DIN 43650 A elbowed
References				
PUR cable, colour black	L = 1 m	**XZ CR1511062F1**	**XZ CR1512062F1**	**XZ CR1523062K1**
	L = 2 m	**XZ CR1511062F2**	**XZ CR1512062F2**	**XZ CR1523062K2**
Weight (kg)		0.065 (L = 1 m), 0.095 (L = 2 m)		
Characteristics				
Type of connection		Male and female: screw threaded		
Degree of protection *(1)*		IP 67		
Ambient air temperature		- 35…+ 90 °C		
Conductor c.s.a.		3 x 0.5 mm²		
Cable diameter		5 mm		
Nominal voltage		∿ 30 V, ⎓ 36 V		
Nominal current		4 A		
Contact resistance		< 5 mΩ		

Dimensions

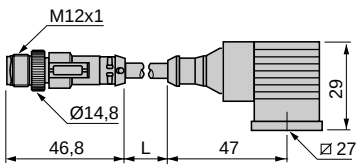
XZ CR1511062F●



XZ CR1512062F●



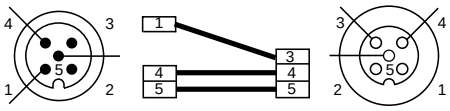
XZ CR1523062K●



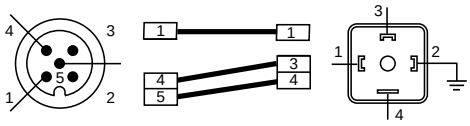
L = 1 or 2 m

Connections

XZ CR1511062F●, XZ CR1512062F●

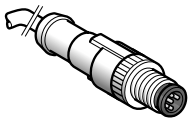


XZ CR1523062K●



(1) Degree of protection with clamping rings correctly tightened.

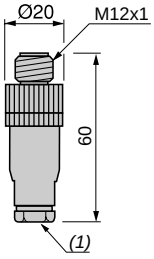
AS-Interface cabling system
Installation system
M12 male connectors and extension cables



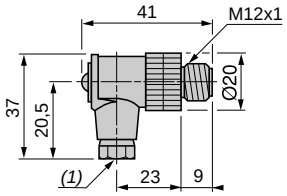
Male connector type		M12, 4-pin, straight		M12, 5-pin, straight
References				
Connection to cable by screw terminal connections		**XZ CC12MDM40B**	**XZ CC12MCM40B**	**–**
PUR cable, colour black	L = 0.5 m	**–**	**–**	**XZ CP1564L05**
	L = 1 m	**–**	**–**	**XZ CP1564L1**
	L = 2 m	**–**	**–**	**XZ CP1564L2**
Weight (kg)		0.020	0.020	0.040 (L = 0.5 m). 0.065 (L = 1 m). 0.115 (L = 2 m)
Characteristics				
Type of connection		Male: screw threaded, metal clamping ring *(1)*		Male: screw threaded
Degree of protection *(2)*		IP 67		IP 67
Ambient air temperature		-40…+85 °C		- 35…+ 90 °C
Conductor c.s.a.		For terminal connections: 4 x 0.75 mm^2 max		4 x 0.34 mm^2 + 1 x 0.5 mm^2 Cable Ø 5.9 mm
Nominal voltage		∿ 125 V, ⎓ 150 V		∿ 30 V, ⎓ 36 V
Nominal current		3 A		4 A
Contact resistance		≤ 8 mΩ		≤ 5 mΩ

Dimensions

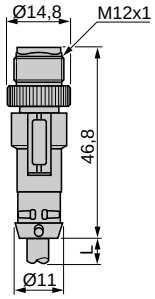
XZ CC12MDM40B



XZ CC12MCM40B



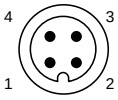
XZ CP1564L●



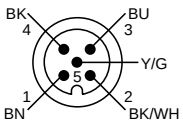
(1) 7 mm plastic cable gland
L = 0.5, 1 or 2 m

Connections

XZ CC12M●M40B



XZ CP1564L●

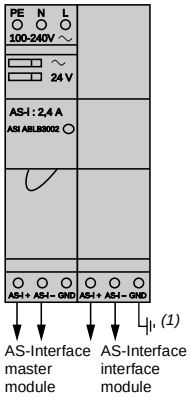


*(1) To order a connector with a plastic clamping ring (all-plastic connector) replace the 2nd letter **M** in the selected reference with a letter **P**.*
***XZ CC12MDM40B** becomes **XZ CC12MDP40B**.*
(2) Degree of protection with clamping ring correctly tightened and cable gland correctly seated.

AS-Interface cabling system
Installation system
Phaseo regulated switch mode power supplies

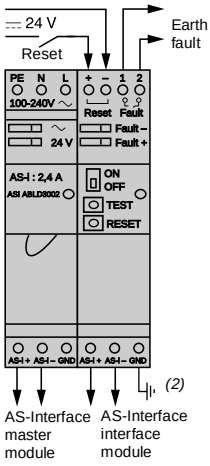
Power supplies for AS-Interface cabling system

Consistent with the standard Phaseo line, the range of ASI ABL power supplies is designed to deliver a d.c. voltage, as required by AS-Interface cabling systems. Three versions are available to meet all needs encountered in industrial applications, in enclosures, cells or floor-standing enclosures. These single-phase, electronic, switch mode power supplies guarantee the quality of the output current, in accordance with the electrical characteristics and conforming to standard EN 50295.



■ **ASI ABLB300●**

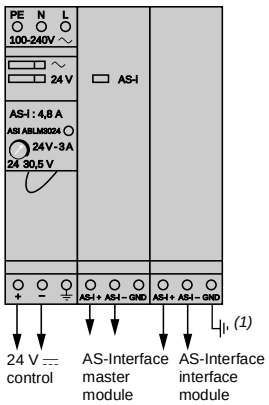
Operating on a 100 to 240 V a.c. supply, this power supply delivers a voltage of 30 V d.c. Available in 2.4 and 4.8 A ratings, the outgoing terminal block allows the cable to be connected separately to the AS-Interface interface modules and to the AS-Interface master. Input and output LEDs allow fast and continuous diagnostics.



■ **ASI ABLD300●**

Operating on a 100 to 240 V a.c. supply, this power supply delivers a voltage of 30 V d.c. Available in 2.4 and 4.8 A ratings, it allows diagnosis and management of earth faults on AS-Interface interface modules. In the event of an earth fault, the Phaseo power supply stops dialogue on the AS-Interface cabling system and puts the installation in a fallback condition. Restarting is only possible after deliberate acknowledgement of the fault. Two inputs/outputs enable dialogue with a processing unit. The outgoing terminal block is used to connect the AS-Interface cable separately to the interface modules and master modules. Input, output and earth fault LED's allow fast and continuous diagnostics.

Warning: the earth (GND) (2) connection must be made. In the event of disconnection, the built-in detector becomes inoperative. To obtain earth connection diagnostics, it is recommended that an ASI ABLB300● power supply be used together with insulation relay RMO PAS 101.



■ **ASI ABLM3024**

Operating on a 100 to 240 V a.c. supply, this product provides two separate power supplies, which are totally independent in the way they operate.
Two output voltages - 30 V/2.4 A (AS-Interface line supply) and 24 V/3 A - are available, so making it possible to supply the control equipment without an additional power supply. Input and output LEDs allow fast and continuous diagnostics.

(1) Recommended connection.
(2) Compulsory connection.

Characteristics : page 4/15
References : page 4/17
Dimensions : page 4/17

AS-Interface cabling system
Installation system
Phaseo regulated switch mode power supplies

Technical characteristics

			ASI ABLB3002	ASI ABLB3004	ASI ABLD3002	ASI ABLD3004	ASI ABLM3024	
Type of power supply								
Functions			Supply to the AS-Interface line (30 V ⎓)				30 V ⎓ supply	24 V ⎓ supply
Product certifications			UL 508, CSA 22-2 n° 950					
Conforming to standards	Safety		EN 60950, TÜV					
	EMC		EN 50081-1, IEC 61000-6-2, EN 55022 class B					
	Low frequency harmonic currents		No					

Input circuit

LED indication			Orange LED					
Input voltage	Rated values	**V**	∿ 100…240					
	Permissible values	**V**	∿ 85…264					
	Permissible frequencies	**Hz**	47…63					
	Efficiency at nominal load	**%**	> 83				> 83	> 80
	Current consumption	**A**	0.5	1	0.5	1		
	Current at switch-on	**A**	< 30					
	Power factor		0.65					

Output circuit

LED indication			Green LED					
Nominal output voltage		**V**	30 (AS-Interface)				⎓ 30	⎓ 24
Nominal output current		**A**	2.4	4.8	2.4	4.8	2.4	3
Precision	Adjustable output voltage	**V**	–				–	100 to 120 %
	Line and load regulation		3 %					
	Residual ripple - interference	**mV**	300 - 50					
Micro-breaks	Holding time for I max and Ve min	**ms**	10					
Protection	Short-circuit		Permanent. Automatic restart after elimination of the fault					
	Overload		1.1 In					
	Overvoltage		Tripping if U > 1.2 Un				U > 1.2 Un	U > 1.5 Un
	Undervoltage		Tripping if U < 0.95 Un				U < 0.95 Un	U < 0.8 Un

Operating characteristics

Connections	Input	**mm²**	2 x 2.5 screw terminals + earth
	Output	**mm²**	2 x 2.5 screw terminals + earth, multiple output
Ambient conditions	Storage temperature	**°C**	- 25 to + 70
	Operating temperature	**°C**	0 to + 60 (derating from 50)
	Maximum relative humidity		95 % (without condensation or dripping water)
	Degree of protection		IP 20 (conforming to IEC 529)
	Vibrations		EN 61131-2
Operating position			Vertical
MTBF		**h**	> 100000 (conforming to Bell core, at 40 °C)
Dielectric strength	Input/output		3000 V/50 Hz/1 mm
	Input/earth		3000 V/50 Hz/1 mm
	Output/earth (and output/output)		500 V/50 Hz/1 mm
Input fuse incorporated			Yes (not interchangeable)
Disturbance	Conducted/radiated		Class B (conforming to EN 55022)
Immunity	Electrostatic discharge		EN 61000-4-2 (4 kV contact/8 kV air)
	Electromagnetic		EN 61000-4-3 level 3 (10 V/m)
	Conducted interference		EN 61000-4-4 level 3 (2 kV), EN 61000-4-6 (10 V)
	Mains interference		EN 61000-4-11

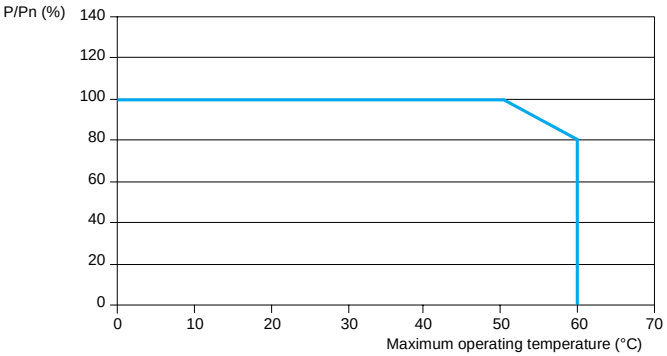
Presentation : page 4/14
References : page 4/17
Dimensions : page 4/17

AS-Interface cabling system
Installation system
Phaseo regulated switch mode power supplies

Output characteristics

Derating

The ambient temperature is a determining factor which limits the power that an electronic power supply can deliver continuously. If the temperature around the electronic components is too high, their life will be significantly reduced.
The graph below shows the power (in relation to the nominal power) which the power supply can deliver continuously, according to the ambient temperature.



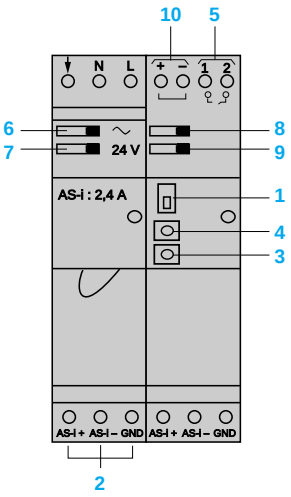
Selection

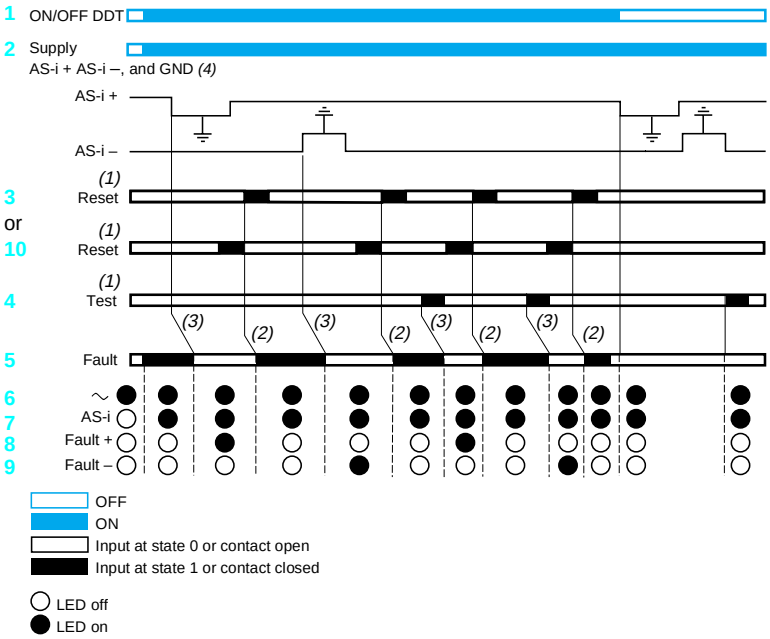
Upstream protection of power supplies for AS-Interface cabling system

Type of mains supply	∿ 115 V single-phase			∿ 230 V single-phase		
Type of protection	Thermal-magnetic circuit-breaker		Gg fuse	Thermal-magnetic circuit-breaker		Gg fuse
Single-pole	GB2 CB●●					
2-pole	GB2 DB●●	C60N		GB2 DB●●	C60N	
ASI ABLB3002	GB2 ●B07	MG24517 *(1)*	2 A	GB2 DB06	MG24516 *(1)*	2 A
ASI ABLB3004	GB2 ●B08	MG24518 *(1)*	4 A	GB2 DB07	MG17453 *(1)*	2 A
ASI ABLD3002	GB2 ●B07	MG24517 *(1)*	2 A	GB2 DB06	MG24516 *(1)*	2 A
ASI ABLD3004	GB2 ●B08	MG24518 *(1)*	4 A	GB2 DB07	MG17453 *(1)*	2 A
ASI ABLM3024	GB2 ●B07	MG24517 *(1)*	2 A	GB2 DB06	MG17453 *(1)*	2 A

(1) UL certified circuit-breaker.

Function diagram





(1) 30 ms min.
(2) 15 ms.
(3) 20 ms.
(4) Warning: the earth fault detector will only operate if the earth (GND) terminal is connected.

AS-Interface cabling system
Installation system
Phaseo regulated switch mode power supplies

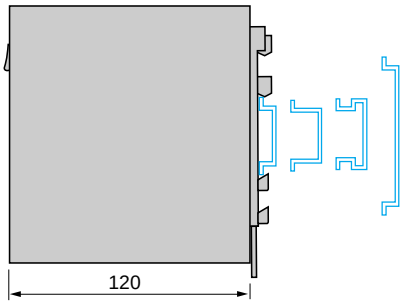
ASI ABL regulated switch mode power supplies

ASI ABL●●●●●

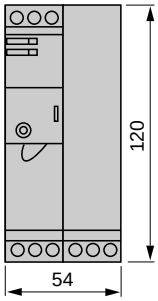
Mains input voltage 47…63 Hz	Output voltage	Nominal power	Nominal current	Auto-protect reset	Earth fault detection	Reference	Weight
V	⎓ V	W	A				kg
100…240 single-phase wide range	30	72	2.4	auto	no	**ASI ABLB3002**	0.800
		145	4.8	auto	no	**ASI ABLB3004**	1.300
		72	2.4	auto	yes	**ASI ABLD3002**	0.800
		145	4.8	auto	yes	**ASI ABLD3004**	1.300
	30 + 24	2 x 72	2.4 + 3	auto	no	**ASI ABLM3024**	1.300

Dimensions

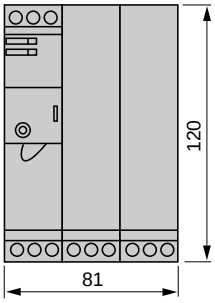
Common side view
Mounting on 35 and 75 mm rails



ASI ABLB3002
ASI ABLD3002

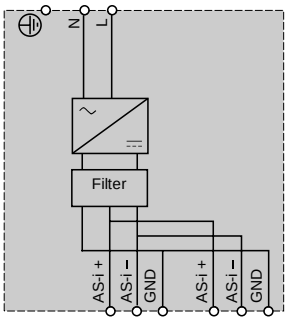


ASI ABLM3024
ASI ABL●3004

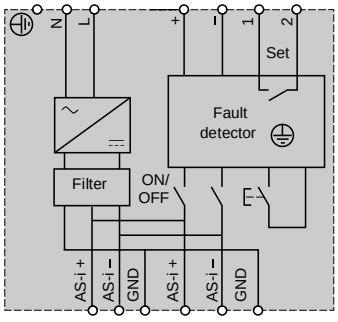


Schemes

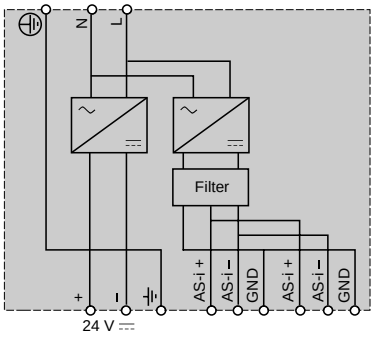
ASI ABLB300●



ASI ABLD300●



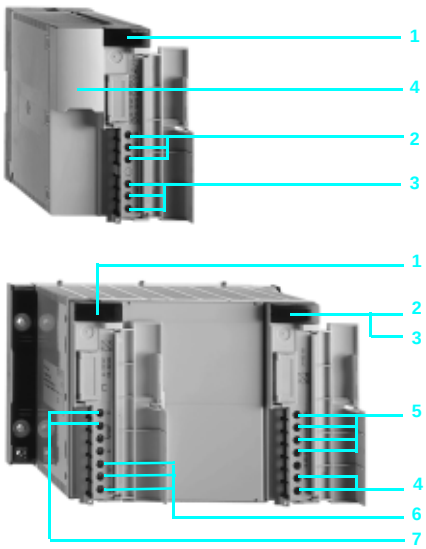
ASI ABLM3024



Presentation : page 4/14
Characteristics : page 4/15

AS-Interface cabling system
Power supply module and unit

Description



The TSX SUP A02 power supply module and the TSX SUP A05 power supply unit integrate the special filters necessary for the AS-Interface line power supply. These elements provide polarisation of the AS-Interface line and power the associated sensors (within the limits of available power). These supplies conform to PLC standards (IEC 1131-1 and IEC 1131-2) in terms of radiation, filtering and interference withstand.
The TSX SUP A05 unit also has a ⎓ 24 V output used to supply other elements which may or may not be connected to the AS-Interface cabling system (PLCs, sensors, actuators, etc).

TSX SUP A02 power supply module
It comprises:
1 An AS-Interface indicator lamp (green) indicating that the 30 V supply is present on the AS-Interface line.
2 Two screw terminals (AS-i + and AS-i -) to connect the AS-Interface line, and one ⏚ terminal to connect the shielding when using a shielded cable.
3 Three screw terminals for connection to the network.
4 A primary voltage selector (∿ 110…120 V and ∿ 200…240 V).

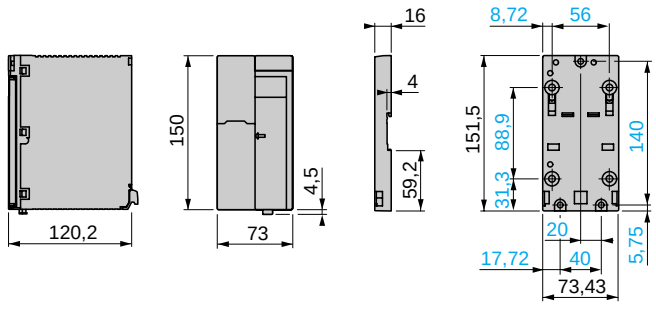
TSX SUP A05 power supply unit
It comprises:
1 An ON indicator lamp (orange), mains supply present.
2 An AS-Interface indicator lamp (green), 30 V supply present on the AS-Interface line.
3 A 24 V indicator lamp (green), 24 V supply present for the auxiliary power supply.
4 Two screw terminals for connection to the AS-Interface line, and one ⏚ terminal to connect the shielding when using a shielded cable.
5 Four screw terminals for the ⎓ 24 V output.
6 Three screw terminals for connection to the network.
7 Two terminals to select the primary voltage (∿ 110…120 V and ∿ 200…240 V).

These two power supplies conform to the fixing dimensions of Modicon TSX Micro PLCs (TSX SUP A02/SUP A05) and Premium PLCs (TSX SUP A05) which enables them to be mounted independently on rails next to TSX Micro/Premium PLCs or, in the case of the TSX SUP A02 module power supply, in a TSX RKY ●● rack of the Premium PLC.

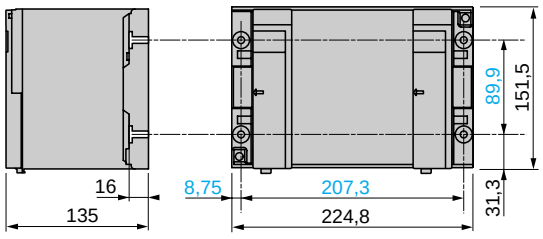
Dimensions

TSX SUP A02
Power supply module

Mounting bracket (provided)



TSX SUP A05
Power supply unit



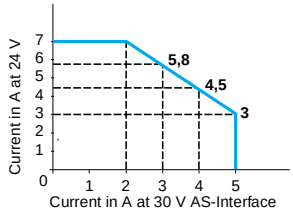
Characteristics: page 4/19
References: page 4/19

AS-Interface cabling system
Power supply module and unit

Characteristics

Type of power supply modules		TSX SUP A02		TSX SUP A05	
Primary nominal voltage	**V**	∿ 100…120	∿ 200…240	∿ 100…120	∿ 200…240
Primary voltage range	**V**	∿ 85…132	∿ 170…264	∿ 85…132	∿ 170…264
Mains frequency limit	**Hz**	47…63			
Maximum time of immunity from micro power cuts	**ms**	10			
Secondary nominal voltages	**V**	30 (AS-Interface line)			24 (process)
Voltage limits	**V**	29.5…31.6			24 ± 3 %
Output current	**A**	2,4 at 60 °C (2.8 A peak)		See output currents graph at 60 °C	
Secondary useful power	**W**	72 at 60 °C		See output currents graph at 60 °C	

TSX SUP A05 output currents
(1)



rms insulation between primary and secondary		**V rms**	3500	
Withstand to electrical fields		**V/m**	10	
Safety extra low voltage (SELV)			Yes	
Emission withstand class			FCC class A	
Conformity to standards	PLC		IEC 1131-1, IEC 1131-2	
	Vibrations		IEC 68-2-6-Fc (2 gn), marine standard IEC 945	IEC 68-2-6-Fc (1 gn), marine standard IEC 945
	Shocks		IEC 68-2-27 (15 gn, 11 ms)	
Temperatures	Operation	**°C**	- 10…+ 60	
	Storage	**°C**	- 25…+ 70	

(1) The TSX SUP A05 power supply unit is a power supply with constant maximum output. Power not consumed on one output is available to another output. Output currents must correspond to the graph shown above.

References

TSX SUP A02

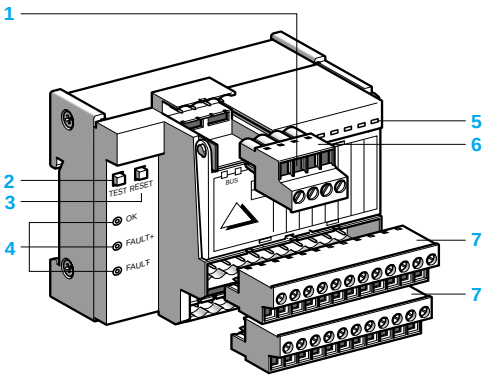
TSX SUP A05

Description	Current at secondary voltage		Reference	Weight
	⎓ 30 V (AS-Interface line)	⎓ 24 V		kg
∿ 100…120 V and ∿ 200…240 V, 50/60 Hz power supply module	2.4 A	–	**TSX SUP A02**	1.050
∿ 100…120 V and ∿ 200…240 V, 50/60 Hz power supply unit	5 A *(1)*	7 A *(1)*	**TSX SUP A05**	2.250

(1) Power supply unit with constant maximum output, see graph above.

Description: page 4/18
Dimensions: page 4/18

AS-Interface cabling system
Installation system
Insulation control relay for AS-Interface line



The **RM0 PAS101** insulation control relay detects and signals any earth fault on either of the 2 polarities of an AS-Interface line segment.
It takes into account any input/output earth faults of PNP intelligent splitter boxes that are not isolated from the AS-Interface line.
Used in conjunction with an impedance adapter **LA9 RM401** on the supply, the **RM0 PAS101** insulation relay also detects any faulty connection of the protective earth to the relay itself and/or the supply.

Presentation

Insulation control relay for AS-Interface: insulation control relay.
1 Connection to the AS-Interface line
2 TEST button
3 RESET button
4 Relay status LED indicator
5 I/O status LED indicator
6 Power supply plug-in terminal block
7 Plug-in terminal blocks

Operating principle

The **RM0 PAS101** insulation control relay is supplied directly from the AS-Interface line. In the event of a fault, 1 of 2 output contacts allows breaking of the supply to the actuators whilst the other can be used to signal the fault to a PLC.
Also, the **RM0 PAS101** insulation control relay inhibits AS-Interface communication in the event of a fault, in order to activate the watchdog functions of the connected slaves.
Resetting and testing of the product can be performed either by using the buttons on the front left-hand side of the relay, or by applying a + 24 V signal to the inputs on the terminal block (control by PLC output).

Operation with no fault present

On power-up of AS-Interface, if the insulation resistance between each of the AS-Interface polarities (AS-i + and AS-i –) and the earth terminal is greater than 40 kΩ, the output relay energises and the “OK” LED illuminates.

Appearance of a fault

If one or both of the resistances measured (R ASi +/Earth and/or R ASi –/Earth) falls below approximately 40 kΩ, or in the event of a fault in the earth connection to the **RM0 PAS101** relay:
■ data exchanges on the AS-Interface line are inhibited which, in turn, triggers an alarm at the AS-Interface master within 5 ms,
■ the output relay contacts open,
■ the polarity on which the fault is detected is signalled by illumination of one of the two LEDs (FAULT + / FAULT –), located on the front left-hand side of the relay.

Fault memory

The contacts remain open and the “Fault” LED stays on, even if the fault disappears, unless the supply to the AS-i + and AS-i – terminals is broken. In this case, providing the fault has disappeared, the relay resets itself when the supply is restored and the output relay contacts reclose.

Resetting

As soon as the fault is eliminated, the relay can be reset which, in turn, extinguishes the associated “Fault” LED. and closes the output relay contacts. Two methods of resetting are possible:
■ locally, by pressing the RESET button,
■ remotely, by a change of state lasting more than 30 ms of the signal between terminals S1 and S2 (see function diagram on next page). This input must be permanently maintained at the high state when not being used for resetting.

Test

The relay has a test feature to simulate faults. Each test sequence alternately simulates an insulation fault on one of the two line polarities. The relay must respond as if the fault were authentic. The relay must then be reset as detailed above. Each subsequent test sequence checks the other polarity of the AS-Interface line (see function diagram on next page).
Two methods of testing are possible:
■ locally, by pressing the TEST button,
■ remotely, by a change of state lasting more than 30 ms of the signal between terminals S3 and S4.

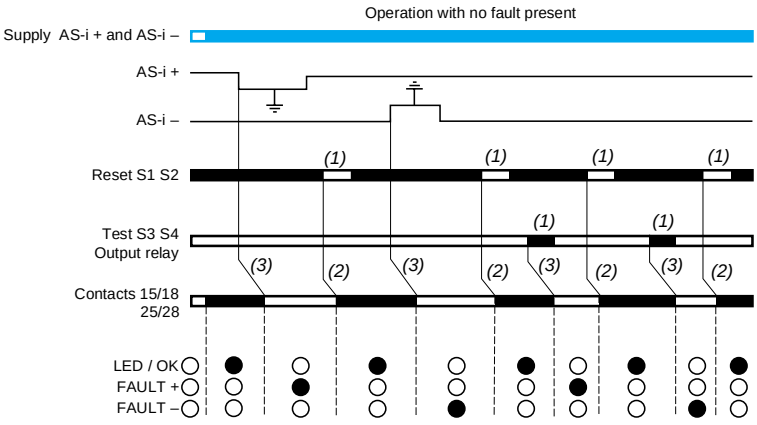
Characteristics : page 4/22
References : page 4/23
Dimensions : page 4/23

AS-Interface cabling system

Installation system

Insulation control relay for AS-Interface line

Function diagram



Relay off
Relay on
Input at state 0 or contact open
Input at state 1 or contact closed

LED off
LED on

(1) 30 ms
(2) 15 ms
(3) 20 ms

4

Characteristics : page 4/22
References : page 4/23
Dimensions : page 4/23

AS-Interface cabling system
Installation system
Insulation control relay for AS-Interface line

Environment

Product certifications			AS-Interface n° 16701	
Conforming to standards			IEC 204, 1 and 2, EN 60204, 1 and 2	
Degree of protection	Conforming to IEC 529 (against direct contact))		IP 2X	
Resistance to incandescent wire	Conforming to IEC 695-2-1	**°C**	750: extinction < 30 s	
Shock resistance	Conforming to IEC 68-2-27	**ms**	11 (half sine wave), 15 gn	
Vibration resistance	Conforming to IEC 68-2-6	**Hz**	5...100, 0.7 gn	
Immunity to electrostatic discharge	Conforming to IEC 1000-4-2	**kV**	8 in open air, 6 on contact	
Immunity to radiated fields	Conforming to IEC 1000-4-3	**MHz**	80...1000	
		V/m	15	
Immunity to transients	Conforming to IEC 1000-4-4	**kV**	2 kV AS-Interface, 1 kV on the inputs	
Ambient air temperature	Operation	**°C**	- 5...+ 60	
	Storage	**°C**	- 25...+ 70	
Insulation voltage (for one minute)	Terminals/mounting rails	**kV**	2	
Installation category	Conforming to IEC 664		II	
Degree of pollution	Conforming to IEC 654		2	
Mounting	Standard mounting rails		On solid mounting plate: 15 mm mounting rail or using ABE ACC01	
			On chassis: 15 mm and 7.5 mm mounting rails	
Cable c.s.a.			1 conductor	2 conductors
	Flexible cable without cable end	**mm²**	0.14…2.5	–
		AWG	26…14	–
	Flexible cable with cable end	**mm²**	0.09…1.5	0.09…0.75
		AWG	28…16	28…20
	Solid cable	**mm²**	0.14…4	0.2…2.5
		AWG	26…12	24…14
Tightening torque	With 3.5 mm flat screwdriver	**Nm**	0.6	

Measuring input characteristics

Operating range		**⎓ V**	29.5…31.6
Average consumption at 30 V	On the AS-Interface line	**mA**	50
Response time	Opening of relay contacts	**ms**	< 20
	AS-Interface communication interrupt	**ms**	< 5
Detection threshold	R AS-i + Earth	**kΩ**	< 15
	R AS-i – Earth	**kΩ**	< 7

Output relay characteristics and operation

Number of C/O contacts			2 relays, each with 1 N/O contact
Output relay state			Energised on absence of fault when AS-Interface + AS-Interface – supplied
Rated operational voltage		**⎓ V**	50
Conventional thermal current	For U contact = ⎓ 24 V	**A**	5
Rated operational current	⎓ 12 V	**A**	5
	⎓ 13 V (U/R =10 ms)	**A**	2
Operating status indication	FAULT +, red LED on		Insulation fault, polarity AS-Interface +
	FAULT –, red LED on		Insulation fault, polarity AS-Interface –
	OK, green LED on		Supply to relay on and no fault present
	Test, yellow LED on		Test input at state 1
	Reset, green LED on		Reset input at state 1
	R1 and R2, green LED on		Output relays energised

Test input and Reset input characteristics (supplied from external source)

Consumption per channel at Un	A Un = ⎓ 24 V	**mA**	13
State 1 guaranteed	U > or I >	**V/mA**	11/5
State 0 guaranteed	U < and I <	**V/mA**	5/2
Conformity	Conforming to IEC 1131-2		Type II

References : page 4/23
Dimensions : page 4/23
Connection : page 4/23

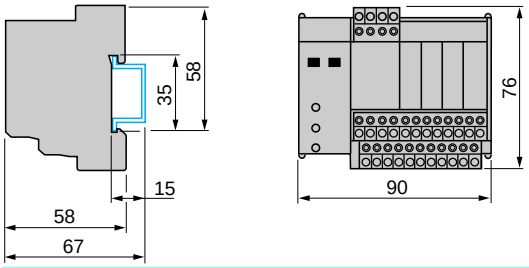
AS-Interface cabling system
Installation system
Insulation control relay for AS-Interface line

References

Description	Reference	Weight kg
Insulation control relay for AS-Interface line (supplied with an impedance adapter)	**RM0 PAS101**	0.260
Impedance adapter (replacement part)	**LA9 RM401**	0.008

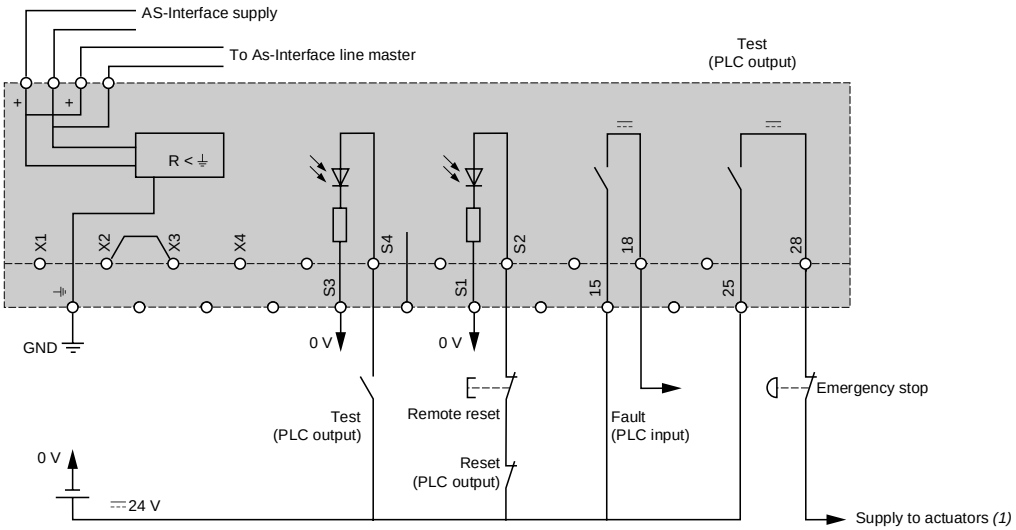
Dimensions

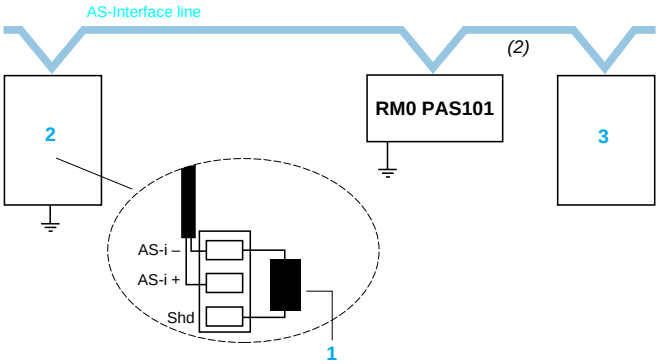
RM0 PAS101



Connection

Recommended wiring scheme





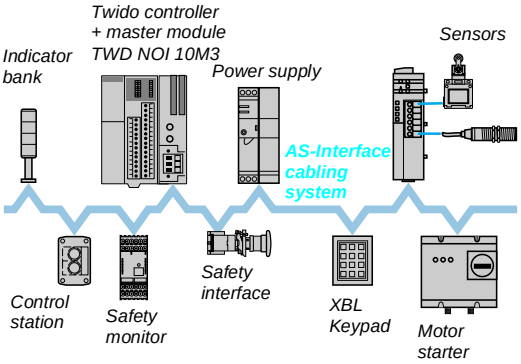
- The insulation control relay impedance is the same as that of a network slave.
- For correct operation, fit the impedance adapter **1** directly on the AS-Interface line supply **2**, between terminals AS-Interface and Shd.
- Connections to earth: both the AS-Interface line supply and the **RM0 PAS101** insulation relay must be connected separately to a reliable earth (resistance < 3 Ω).

1 Impedance adapter LA9 RM401.
2 AS-Interface line supply.
3 AS-Interface master.

(1) Use an interposing relay if the current consumption of the actuators is greater than the breaking capacity of the internal relay (DC12: 5A/30 V, DC13: 1.5 A/30 V)
(2) Maximum distance between the insulation control relay and the AS-Interface cabling system master: 2 metres
*Voltage at the **RM0 PAS101** insulation control relay must be between 29.5 and 31.6 V.*

Characteristics :
page 4/22

AS-Interface cabling system
Installation system
Master module for Twido PLCs



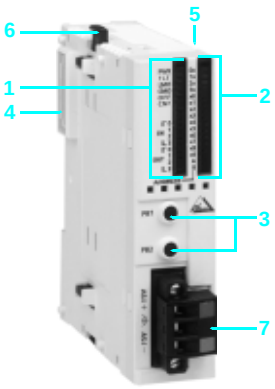
Presentation

Master module TWD NOI 10M3, for AS-Interface cabling system allows the Twido controller (version ⩾ 2.0) to perform the function of AS-Interface master.

The cabling system consists of a master station (Twido controller) and slave stations. The master, which supports the AS-Interface profile, polls each of the devices connected to the AS-Interface cabling system, in turn, and stores information gathered (sensor/actuator status, operating status of the devices) in the controller memory. Communication on the AS-Interface cabling system is managed in a way that is totally transparent to the Twido application program.

The TWD NOI 10M3 master module manages the following with the AS-Interface M3 profile:
- discrete slave modules (maximum of 62 slaves arranged in 2 banks, A and B, of 31 addresses each),
- analogue slaves (maximum of 7 slaves in bank A).

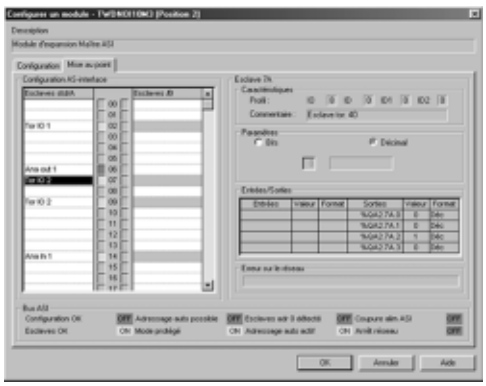
The AS-Interface M3 profile supports analogue profile 7.3 (7 slaves), but does not support analogue profile S-7.4.
The maximum number of TWD NOI 10M3 modules per Twido controller is 2.
7 discrete, analogue and AS-Interface I/O modules are controlled by TwidoSoft software *(1)*.
An AS-Interface power supply is essential to supply the various modules on the cabling system. It should preferably be located close to the stations with high power consumption.
For more information on power supplies, see page 4/17.



Description

Module TWD NOI 10M3 takes the form of a standard-size module. It is connected to a Twido base controller (compact or modular) in the same way as any I/O module.
It has the following on the front panel:
1 A display block comprising:
- 6 pilot lights indicating the module operating modes:
  - green PWR pilot light: module powered up,
  - red FLT pilot light: error in the configuration loaded,
  - green LMO pilot light: module in local mode,
  - green CMO pilot light: module in connected mode,
  - red CNF pilot light: not used,
  - red OFF pilot light: module in protected, unconnected mode.
- 6 green pilot lights, 3 for inputs, 3 for outputs.

2 A block for displaying the status of the addresses.
3 Two pushbuttons PB1 and PB2 for controlling the status of the slaves by selecting their address and changing the mode.
4 An extension connector for electrical connection to the previous module.
5 A connector (on the RH side) for I/O expansion modules TWD D●● and TWD A●● (4 or 7 depending on version).
6 A latching mechanism for attachment to the previous module.
7 A power supply removable screw terminal block.



Diagnostics

The 30 pilot lights on the front panel of the module are used in conjunction with the two pushbuttons for diagnostics by the Twido controller.
The display block on the front panel of master module TWD NOI 10M3 allows simplified local diagnostics to be performed by displaying the slaves present on the AS-Interface cabling system.

Software set-up

The AS-Interface cabling system is configured by the TwidoSoft software *(1)*.
The services offered are based on the principle of simplicity:
- Management of profile tables, parameters and data by the master, in a way that is transparent to the user.
- Topological addressing of I/O: any AS-Interface slave defined on the cabling system has a topological address assigned to it, in a way that is transparent to the user.

Each AS-Interface module sensor/actuator is seen by the Twido programmable controller in the same way as any “In-rack" I/O.

(1) Please consult our catalogue “Twido programmable controllers”

AS-Interface cabling system
Installation system
Master module for Twido PLCs

General characteristics

Module type			TWD NOI 10M3
AS-Interface profile			AS-Interface M3, V 2.11 (profile S-7.4 not supported)
Type of addressing			Standard and extended
Product certifications			AS-Interface n° 47801
Degree of protection			IP 20
Altitude		**m**	Operation: 0…2000. Transport: 0…3000
Temperature		**°C**	Operation: 0…+ 55. Storage: - 25…+ 70
Relative humidity			30 to 95 % (without condensation)
Degree of pollution			2 conforming to IEC 60664
Immunity to corrosion			Free of corrosive gases
Vibration resistance	Mounted on ⊓ rail	**Hz**	10…57, amplitude 0.075 mm, 57…150 (acceleration: 9.8 m/s²); for 2 hours on all 3 axes
	Plate or panel mounted (using fixing kit TWD XMT5)	**Hz**	2…25, amplitude 1.6 mm, 25…100 (acceleration: 39.2 m/s²); for 90 minutes on all 3 axes
Shock resistance		**m/s²**	147 (15 gn) duration 11 ms, on all 3 axes
As-Interface external power supply		**⎓ V**	29.5…31.6
Internal current	At ⎓ 5 V	**mA**	80
	At ⎓ 24 V	**mA**	0
AS-Interface consumption at ⎓ 24 V		**mW**	540

Communication characteristics

As-Interface cabling system cycle time	With 1 to 19 slaves	**ms**	3
	With 20 to 62 slaves	**ms**	0.156 x (1 + N) where N = number of active slaves
	With 31 standard slaves or slaves in banks A and B	**ms**	5
	With 62 slaves in banks A and B	**ms**	10
Max. no. of modules	Analogue modules *(1)*		7
	Discrete modules *(1)*		62
Max. no. of I/O	Standard slaves		248 = 124 inputs + 124 outputs
	Slaves in banks A and B		434 = 248 inputs + 186 outputs
Max. length of AS-Interface cable	Without splitter block or extension	**m**	100
	With a total of 2 splitter blocks or extensions	**m**	300
AS-Interface cabling system voltage		**⎓ V**	30

References

TWD NOI 10M3

Description	Number per controller	Protocol/profile	Number of I/O *(1)*	Reference	Weight kg
AS-Interface master module for Twido programmable controllers V ≥ 2.0	2	AS-Interface/M3	62 discrete modules max., 7 analogue modules max.	**TWD NOI 10M3**	0.085

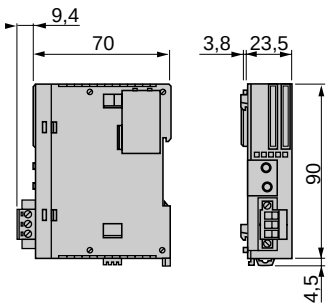
Description	Description	Reference	Weight kg
Fixing kit	For plate or panel mounting of the module Sold in lots of 5	**TWD XMT5**	–

Description	Power supply	Length m	Reference	Weight kg
Flat cable for AS-Interface cabling system (yellow)	For AS-Interface cabling system	20	**XZ CB 10201**	1.400
		50	**XZ CB 10501**	3.500
		100	**XZ CB 11001**	7.000

(1) When analogue and discrete modules are connected simultaneously to the system, the analogue modules use addresses 1 to 31 in bank A. When an analogue module uses a certain address, the module addresses having the same number in bank B cannot be occupied for slaves in banks A/B.

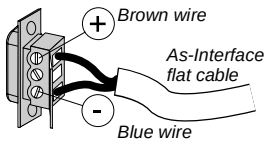
Dimensions

TWD NOI 10M3



Connection

TWD NOI 10M3



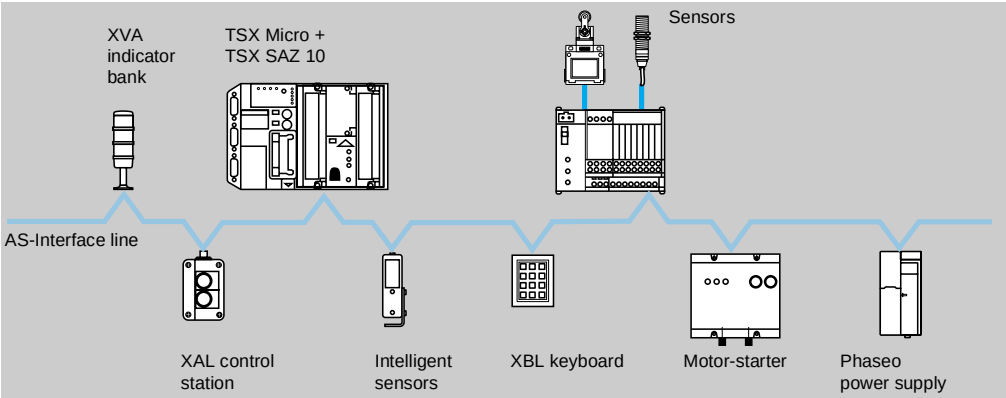
AS-Interface cabling system

Installation system

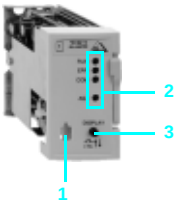
TSX SAZ master module for Modicon TSX Micro PLCs

Presentation

The TSX SAZ 10 AS-Interface module enables the TSX Micro PLC to act as the AS-Interface system master. In this way up to 31 sensor/actuator type devices may be managed on the M2 AS-Interface profile *(AS-Interface V1)*. Up to 4 inputs and/or outputs can be connected to each device, giving a maximum of 248 I/O on one segment.



The AS-Interface cabling system comprises a master station (TSX Micro PLC) and slave stations. The TSX SAZ 10 module supports the AS-Interface M2 profile, interrogates the device connected on the AS-Interface line in turn and stores the data (state of sensors/actuators, operational status of devices) in the PLC memory. Communication management on the AS-Interface line is completely transparent with regard to the PLC application program.
An AS-Interface power supply must be used for powering the various components on the AS-Interface line. Ideally this power supply should be situated nearest to the stations with the largest current demands (see pages 4/17 and 4/19).



Description

The TSX SAZ 10 AS-Interface master is a half-format module designed to slot into the basic configurations of TSX 37-10/21/22 Micro PLCs, in position 4 (one TSX SAZ 10 module per configuration) *(1)*.

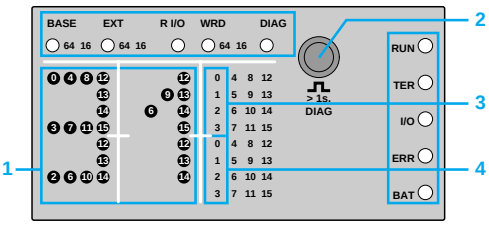
The front panel comprises:

1 An opening with locating device for routing AS-Interface line ribbon or round cable (to be connected to a terminal block inside the module)

2 Four indicator lamps:

- RUN: the module is active
- ERR: module fault or bus connection fault
- COM: AS-Interface line communication is active
- AS-i: Line configuration error

3 A pushbutton to transfer the AS-Interface line display to the PLC front panel.



Diagnostics

The TSX Micro PLC centralised display block enables the display of the status of all the I/O channels, and the diagnostics for devices on the AS-Interface line (present, missing, faulty, not conforming to the configuration):

1 Device number

2 Control pushbutton for accessing the various operating modes of the display block

3 State of the 4 device inputs

4 State of the 4 device outputs.

(1) When the TSX SAZ 10 module is in position 4, the upper position 3 can only receive a TSX A●Z ●●●● analogue or TSX CTZ ●●● counter half-format module.

Characteristics:
page 4/31

AS-Interface cabling system

Installation system

TSX SAZ master module for Modicon TSX Micro PLCs

TSX SAZ 10

References

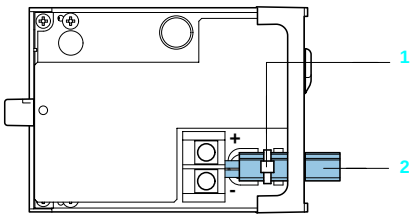
Description	Number per TSX Micro PLC	Profile	Max. number of I/Os	Reference	Weight kg
AS-Interface master module for TSX Micro PLC	1 for 37 10 1 for 37 21 1 for 37 22	AS-Interface M2	31 discrete devices, thus 248 I/O	**TSX SAZ 10**	0.180

Connection accessories

Description	Use	Length	Reference	Weight kg
AS-Interface line ribbon cables (yellow)	For AS-Interface line	20 m	**XZ CB 10201**	1.400
		50 m	**XZ CB 10501**	3.500
		100 m	**XZ CB 11001**	7.000

Connections

TSX SAZ 10 master module



1 AS-Interface cable locking collar
2 AS-Interface cable (ribbon with locating device or round) (+ brown, - blue)

4

Characteristics:
page 4/31

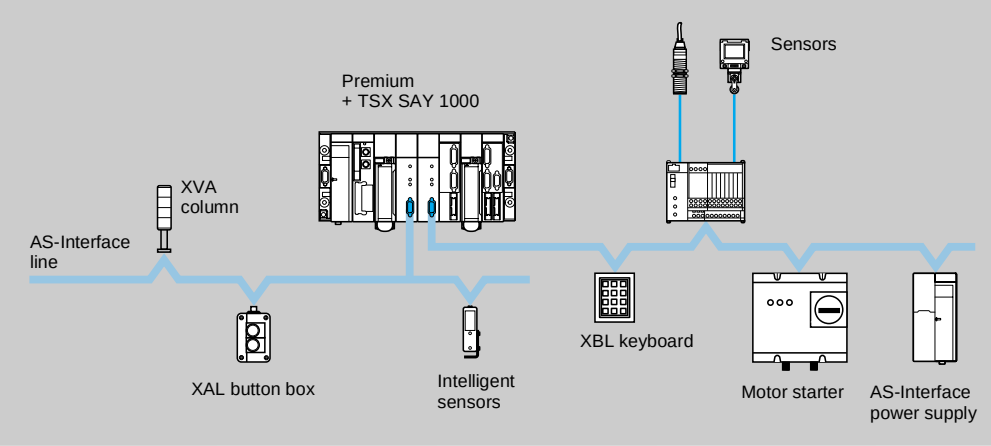
AS-Interface cabling system

Installation system

TSX SAY master module for Modicon Premium PLCs

Presentation

TSX SAY 1000 master module for the AS-Interface cabling system enables the Premium PLC or the Atrium slot-PLC to act as the AS-Interface master.



The AS-Interface cabling system comprises a master station (Premium PLC or Atrium slot-PLC) and slave stations. The master that supports the AS-Interface profile successively interrogates the devices connected on the AS-Interface cabling system and stores the data (status of sensor/actuators, operational status of devices) in the PLC memory. Communication management on the AS-Interface line is completely transparent with regard to the PLC application program.

TSX SAY 1000 master module with the AS-Interface M2E profile *(AS-Interface V2)* manages:

- Discrete slave devices (a maximum of 62 devices organized in 2 banks, A/B, with 31 addresses each),
- Analog devices (a maximum of 31 devices in bank A)
- Safety interfaces (a maximum of 31 devices in bank A).

The maximum number of TSX SAY 1000 modules per PLC station or slot-PLC is either 1, 2, 4 or 8, depending on the type of processor or slot-PLC installed (see page 4/29).
An AS-Interface power supply must be used for powering the various devices on the line. Ideally, this power supply should be situated nearest to the stations with the largest power demands (see pages 4/17 and 4/19).

Description

TSX SAY 1000 AS-Interface master module is standard format modules. Modules of this format are designed to slot into any position on the Premium PLC rack like any Input/Output module or application-specific module. The modules feature, on the front panel:

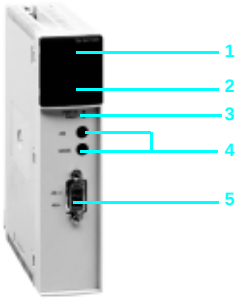
1 A display unit comprising 4 indicator lamps showing the module operating modes:
- RUN indicator lamp (green): module operating,
- ERR indicator lamp (red): module fault,
- A/B indicator lamp (green): display of group of 32 slaves,
- I/O indicator lamp (red): AS-Interface line I/O fault.

2 A display unit comprising 32 indicator lamps for diagnostics of the AS-Interface line and of each slave connected to the line depending on the A/B pushbutton selected *(1)*.

3 Two or three indicator lamps specific to the module: see diagnostics on page 4/29.

4 Two pushbuttons: see diagnostics on page 4/29.

5 One 3-way male SUB-D connector for connection to the AS-Interface cable (female screw connector supplied).



TSX SAY 1000

(1) Depending on the selection made with the A/B pushbutton, the first 31 slaves (standard address settings) or the last 31 slaves (extended address settings with AS-Interface V2) are displayed.

Characteristics:
Page 4/31

AS-Interface cabling system
Installation system
TSX SAY master module for Modicon Premium PLCs

TSX SAY 1000

Diagnostics

TSX SAY 1000 module *(AS-Interface V2)*

The two indicator lamps 3 on the front panel of the TSX SAY 1000 module that correspond to the two pushbuttons 4 are used for diagnostics at module level:

Indicator lamps marked:		Pushbuttons marked:	
PWR: AS-Interface power supply present	FAULT: AS-Interface line fault	A/B: selection of slave group on display unit 2	MODE: module Off line/On line

The display unit on the front panel of the TSX SAY 1000 master module allows simplified local diagnostics to be performed by displaying the slave devices on the AS-Interface line. Detailed diagnostics for each of these slave devices can be carried out via the ASI-TERV2 adjustment console.

References

Description	Number per PLC	Profile	Max. number of I/Os *(1)*	Reference	Weight kg
AS-Interface master module *(2)* **for Premium PLCs and Atrium slot-PLCs**	1 for 57 C● 1 for 57 0● 2 for 57 1● 4 for 57 2● 8 for 57 3● 8 for 57 4● 8 for 57 5●	AS-Interface M2E	62 discrete devices 31 analog devices (3) 31 safety devices	**TSX SAY 1000**	0.340

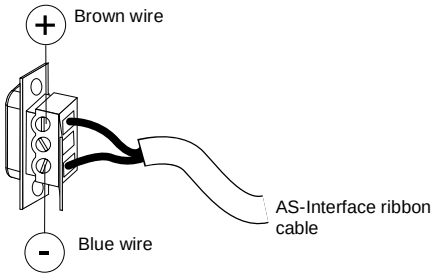
Connection accessories

Description	Supply	Length	Reference	Weight kg
AS-Interface ribbon cables (yellow)	For AS-Interface line	20 m	**XZ-CB 10201**	1.400
		50 m	**XZ-CB 10501**	3.500
		100 m	**XZ-CB 11001**	7.000

(1) These maximum values cannot be cumulated: see the characteristics on page 4/31.
(2) The 3-way SUB-D connector for connection to the AS-Interface cable is supplied with the module.
(3) Supports analog devices that have between 1 and 4 input or output channels.

Connections

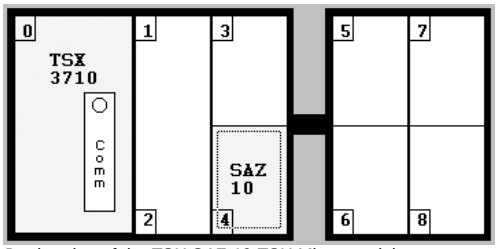
TSX SAY 1000 module



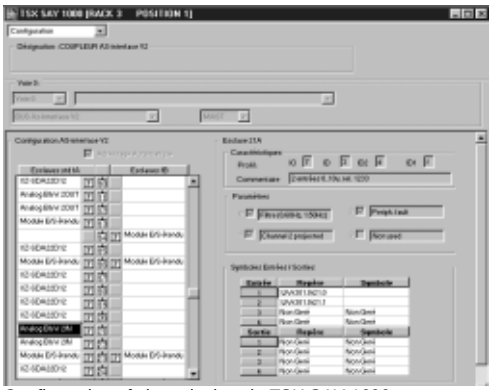
AS-Interface cabling system
Installation system
Master modules for Modicon TSX Micro/Premium PLCs

Software setup

The AS-Interface cabling system is configured using Unity Pro or PL7 Micro/Junior/Pro software. The services offered are based on the principle of simplicity:
- Management of profile tables, parameters and data by the master (this management is transparent to the user).
- Topological I/O addressing: each AS-Interface slave declared on the bus is assigned a topological address on the line. This is transparent to the user.
- Each sensor/actuator for the AS-Interface is treated as an in-rack I/O by the TSX Micro/Premium PLC.



Declaration of the TSX SAZ 10 TSX Micro module


Configuration of slave devices in TSX SAY 1000

AS-Interface cabling system configuration

All devices on the AS-Interface line are configured implicitly using the following sequence of screens:

Declaration of the AS-Interface master module
- The TSX SAZ 10 module is always inserted and declared in position no. 4 on TSX 37 10/21/22 TSX Micro automation platform,
- TSX SAY 1000 modules can be inserted into any position on Premium automation platform or Atrium slot-PLCs (except positions reserved for processors and power supplies).

Configuration of AS-Interface slave devices

Using the configuration screen, it is possible to configure all the slave devices corresponding to all interface I/Os on the AS-Interface line. Depending on its type, the configuration for each device consists of defining, as appropriate:
- Schneider Electric AS-Interface devices.

The user selects the AS-Interface device catalogue reference from the various discrete, analog, or safety interfaces listed. This selection automatically determines the AS-Interface profile and the parameters associated with each interface.
- Third-party AS-Interface device.

The user can use Unity Pro or PL7 Micro/Junior software to manage a “customized” list of sensors/actuators of different brands. This list, specifying the AS-Interface profile and parameters, is compiled to meet the needs of the user.

Programming

After configuration, the I/Os connected on the AS-Interface line are processed by the application program in the same way as an in-rack I/O of the PLC, using either the address (e.g. %I\4.0\16.2, input 2 of slave 16 of the AS-Interface line), or the associated symbol (e.g. Start_conveyor).

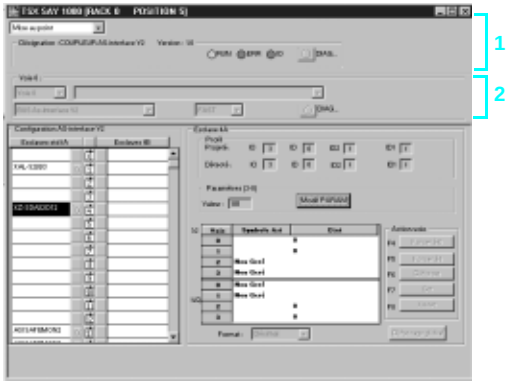
Unity Pro or PL7 Junior/Pro software has an integrated function block library containing the specific diagnostic DFBs for AS-Interface line. Its check for the appearance of any error on the AS-Interface (line or slaves) or, if present, on the ASI SAFENON● safety module.

Presentation:
pages 4/26 and 4/28

Description:
pages 4/26 and 4/28

References:
pages 4/27 and 4/29

AS-Interface cabling system
Installation system
Master modules for Modicon TSX Micro/Premium PLCs



Diagnostics of the TSX SAY 1000 module using PL7

Diagnostics

Diagnostics performed using the centralized display unit of the TSX Micro platform, or using the TSX SAY 1000 module display unit of the Premium PLC or Atrium slot-PLC can be completed using a PC terminal on which Unity Pro or PL7 Micro/Junior/Pro software has been installed.

The terminal connected to the TSX Micro/Premium PLC is used to perform diagnostics of the operating state of the:
- TSX SAZ 10 and TSX SAY 1000 master modules,
- AS-Interface line,
- Slave devices on the line.

For the AS-Interface V2 TSX SAY 1000 master module, the diagnostics take into account developments in the M2E standard.

Diagnostics are performed using a single screen divided into four sections providing information on:
1 Status of the TSX SAZ 10 or TSX SAY 1000 module (RUN, ERR, I/O).
2 Status of the AS-Interface channel connected to the module.
3 Faulty interface (or slave).
4 Data relating to any selected interface (profile, parameters, forcing, etc).

In the event of an AS-Interface module or channel fault, a second screen can be accessed, which clearly shows the type of fault, which may be at internal or external level.

Characteristics

Type of module		TSX SAZ 10	TSX SAY 1000
AS-Interface profile		M2 (AS-Interface V1)	M2E (AS-Interface V2)
Type of addressing		Standard	Standard and extended
Product certifications		AS-Interface No. 12001, IEC 61131 2	Pending
Ambient air temperature	Operation	0…+60 °C.	
	Storage	-25…+70 °C.	
Degree of protection		IP 20	
Vibration resistance		Conforming to IEC 68 2 6. Fc tests.	
Shock resistance		Conforming to IEC 68 2 27. EA tests.	
Number of connectable interfaces (or slaves)	With standard addressing	31 slaves	
	With extended addressing	–	31 slaves
Type of connectable interfaces	With standard addressing	Discrete I/Os (4I/4O)	Discrete I/Os (4I/4O) *(1)* Analog I/Os (a maximum of 4 channels) Safety interfaces
	With extended addressing	–	Discrete I/Os (4I/3O)
Line connection		By terminal block inside module (polarity locating device)	By 3-way SUB-D connector (included with the module)
Module power supply		Via power supply integrated into the host platform of the module	
Display/diagnostics		Via: □ centralized display unit on TSX Micro PLC or via the display unit of TSX SAY 1000 module □ use of the Unity Pro or PL7 Micro/Junior/Pro software diagnostics function □ use of the ASI-TERV1 adjustment console (infrared link)	

(1) If the interfaces are connected using extended addressing, the type of discrete I/Os is 4I/3O (instead of 4I/4O).

Presentation:
pages 4/26 and 4/28

Description:
pages 4/26 and 4/28

References:
pages 4/27 and 4/29

AS-Interface cabling system

Installation system

Master module for Modicon Quantum PLCs

Presentation

The actuator sensor Interface (AS-Interface) is used in low-level automation systems as a digital replacement for conventional parallel wiring. This digital serial interface is comprised of a single, unshielded two-wire cable permitting communications to field-level devices (sensors and actuators) with internal intelligence.

The 140 EIA 921 00 Modicon Quantum AS-Interface module is a single-slot module with one AS-Interface channel per module. The Quantum I/O map interface makes the module useable in local, remote (RIO) and distributed (DIO) Quantum I/O drops.

Network media and topology

AS-Interface line uses an unshielded 2-wire cable for data and energy. The protocol is based on a master/slave hierarchy and allows up to 31 slave devices to be connected on a single network. This bus operates up to 100 meters, although additional distances can be achieved through the use of repeaters.

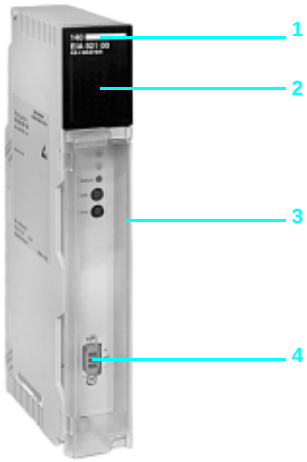
AS-Interface is less complex than many of the other open digital communication protocols in the market, since it is tailored to the needs of the devices such as actuators and sensors where connection cost is of greater importance than complexity of the data to be handled.

The topology of the AS-Interface cabling system is totally flexible and can be adapted to users' requirements (point-to-point, line, and tree structure topology). In all cases, the total length of all the branches of the bus must not exceed 100 meters without using repeaters.

The AS-Interface cable is a two-wire link on which communication and power are transmitted to the connected devices. It is not necessary for the link to be twisted, and the wire cross-section can be 2 X 0.75 mm^2, 2 X 1.5 mm^2, or 2 X 2.5 mm^2, depending on the current consumption of the devices.

Functions of the Quantum AS-Interface module

- Useable with all Quantum CPUs.
- Module parameter setup through Unity Pro, Concept 2.6 and ProWORX 32.
- Quantum I/O map interface allows 4 modules per local drop, 4 per remote drop, and 2 per distributed I/O drop.
- Display block of 32 LED indicators displays slave addresses and state of slave input/output bits.
- Hot swap function available without damage for all Quantum I/O racks.
- Protected against reverse polarity of AS-Interface line inputs.
- Less commissioning time and increased diagnostic capability reduces the overall cost of an automated system.
- Automated device reconfiguration (addresses and parameters).



Description

The 140 EIA 921 00 AS-Interface bus module is comprised of the following:

1 Model number and color code.
2 Display block of 32 LED indicators.
3 Removable clear hinged door.
4 SUB-D 3-way male connector for AS-Interface link.

AS-Interface cabling system
Installation system
Master module for Modicon Quantum PLCs

Characteristics

Model			140 EIA 921 00
AS-Interface line	AS-Interface version supported		V1
	AS-Interface master profile		M2 (standard addressing)
	Maximum cycle time	**ms**	5
	Maximum bus length	**m**	100 without repeater
	Maximum no. of I/O points		124 discrete inputs and 124 discrete outputs
	Maximum no. of slaves on the line		31
	Nominal supply line voltage	⎓ **V**	30
	AS-Interface scan time for “n” slaves	**µs**	156 x (n+2) if n < 31 slaves
			156 x (n+1) if n = 31 slaves
	Transmission rate	**K bits/s**	167 approx.
Quantum AS-Interface module	Consumption	**mA**	60 typical at ⎓ 30 V, 100 max.
	Protection against reverse polarity		Yes
	Degree of protection		IP 20
	Operating temperature	**°C (°F)**	0...+ 60 (+ 32...+ 140)
	Product certifications		UL, CSA, CE

References

140 EIA 921 00

XZ CB1●●01

Description	Number per Qauntum PLC	Profile	Max. number of I/Os	Reference	Weight kg
AS-Interface master module for Quantum PLCs	4 per local drop 4 per remote drop (RIO) 2 per distribute drop (DIO)	AS-Interface M2	31 discrete devices, thus 248 I/O	**140 EIA 921 00**	0.450

Separate parts

Description	Use	Length	Reference	Weight kg
AS-Interface line ribbon cables (yellow)	For AS-Interface line	20 m	**XZ CB 10201**	1.400
		50 m	**XZ CB 10501**	3.500
		100 m	**XZ CB 11001**	7.000

Description	Use	Language	Reference	Weight kg
Documen-tation	Quantum AS-Interface module user guide	English	**840 USE 117 00**	–

AS-Interface cabling system

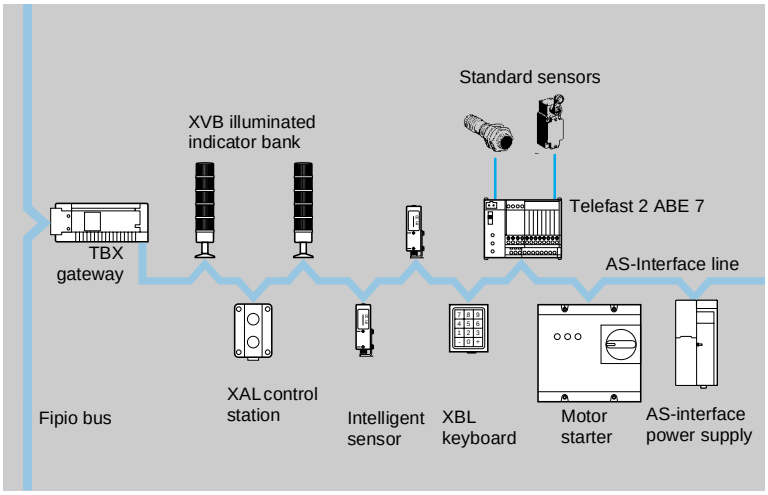
Installation system

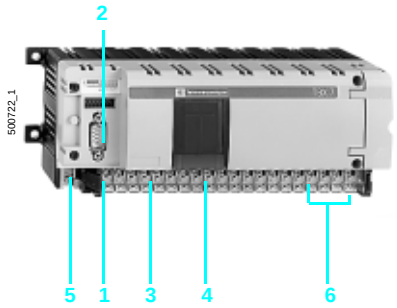
Fipio bus gateway module for AS-Interface line

Presentation

The TBX SAP 10 AS-I gateway module provides a connection between the Fipio bus and AS-Interface cabling system. It is Agent on the Fipio bus and master on the AS-Interface line. It manages the I/O present on the AS-Interface line so that they are available in read/write at the level of the Fipio bus master PLC. It supports the AS-Interface M2 profile and is used for connecting the AS-Interface line to Schneider Electric PLCs.

The TBX SAP 10 module comes in the form of a TBX monobloc module and manages up to 248 I/O (124 inputs and 124 outputs). Up to 16 TBX SAP 10 modules can be connected on a Fipio bus (3968 I/O max.).

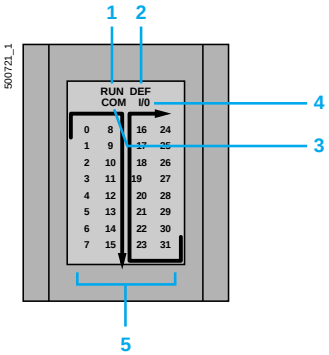




Description

The TBX SAP 10 module comprises:

1 Male 9-way SUB-D connector for connection to the Fipio bus.
2 Dip switches for setting the Fipio bus addressing.
3 Slot for the user's connection point/module identification label.
4 Display block (see below).
5 Screw clamp for earthing the module.
6 Removable screw terminal block (with terminal label) for wiring the AS-Interface line.



Display block

The TBX SAP 10 module has a display block with:

1 RUN lamp (green) : lights up to indicate that the devices running.
2 DEF lamp (red) : lights up to indicate a device fault, and flashes to indicate a Fipio connection fault.
3 COM lamp (yellow) : Fipio frame sent and received.
4 I/O lamp (red) : lights up to indicate a fault on the AS-Interface line.
The indicator lamps light up to indicate that the slave is present, and flash to indicate a configuration fault.
5 AS-Interface slaves, 1 to 31.

AS-Interface cabling system
Installation system
Fipio bus gateway module for AS-Interface line

Software setup

The AS-Interface cabling system can be set up from the TSX Micro or Premium automation platform using Unity Pro (Premium only) or PL7 Micro/Junior/Pro software. The key feature of all the services offered is simplicity:

- Management of profile tables, parameters and data by the master (transparent to the user).
- Topological I/O addressing: All AS-Interface slaves declared on the line are assigned a topological address (transparent to the user).
- Each sensor/actuator on the AS-Interface cabling system is seen by the TSX Micro/Premium PLC in the same way as any in-rack I/O.

Characteristics

Type of master		TBX SAP 10
Product certifications		AS-Interface n° 04601, NF C 63-850
AS-Interface profil		M2
Temperature	Operation	0…+ 60 °C.
	Storage	- 25…+ 70 °C
Degree of protection		IP 20
Vibration resistance		Conforming to IEC 68-2-6. Fc test
Shock resistance		Conforming to IEC 68-2-27. EA test
Number of connectable slaves		31 AS-Interface slaves
Number of Inputs/Outputs		124 discrete inputs and 124 discrete outputs
Connection to the	Fipio bus	Via **TBX BLP 01 connector**
	AS-Interface line	On screw terminal block
Power supply		Via external power supply ⎓ 24 V/48 V
Display/diagnostics		Via display block on the gateway module

References

TBX SAP 10

TBX BLP 01

Fipio bus/AS-Interface line gateway module

Description	Power supply	Number of I/O	Reference	Weight kg
AS-Interface gateway module	⎓ 24/48 V	124 I/124 O (discrete)	**TBX SAP 10**	0.820

Documentation

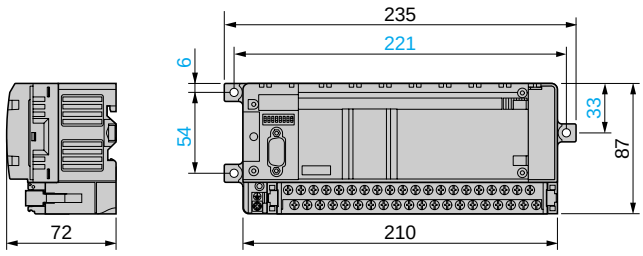
Description	Format	To be ordered separately	Reference	Weight kg
User manual gateway module	A5	Yes	**TBX DM SAP 10F**	0.170

Connexion accessory

Description	Use	Reference	Weight kg
Female 9-way SUB-D type connector	Connecting TBX SAP 10 module to the Fipio bus	**TBX BLP 01**	0.080

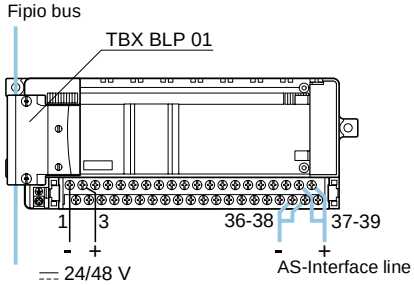
Dimensions, connections

TBX SAP 10 gateway module



Connections

Fipio bus



AS-Interface cabling system
Installation system
Modbus/Modbus Plus gateway modules for AS-Interface line

XZ ML1●●●● gateway modules are slaves on the supervisory line and masters on the AS-Interface line. They manage the inputs/outputs present on the AS-Interface cabling system so that these are available for read/write functions.
They provide the connection between the various buses and the AS-Interface line. They support the AS-Interface M1 profile and allow the AS-Interface sensors/actuators to be connected to processing units.

Gateway modules

Module type		**XZ ML12222**	**XZ ML16222**
Product certifications		AS-Interface n° 04601	
Ambient air temperature around the device		Operation: 0…+ 55 °C. Storage: - 25…+ 85 °C	
Degree of protection		IP 20	
Vibration resistance		1 gn (f = 2…150 Hz) conforming to IEC 68-2-6	
Shock resistance		30 gn, 11 ms, conforming to IEC 68-2-27	
Number of slaves which can be connected		1…31 AS-Interface slaves	
Connection to AS-Interface		By screw terminals 2 x 1.5 mm², with cable ends	
Link to the supervisor	Protocol	Modbus	Modbus Plus
	Type	RS 232C	RS 485
	Number	1	
	Speed	1.2…57.6 K Bauds	1 M bits/s
	Multiplexing	No	Yes, 64 addresses
	Connection	By 9-pin SUB-D connector	
Power supply	Type	From the line (type A)	
	Current	< 200 mA	
	Voltage	Provided from the line	
	Connection	–	
Diagnostics		–	By the line
Indication		By LED and 2 x 7 segment display, for diagnostics and maintenance	

Gateway modules (continued)

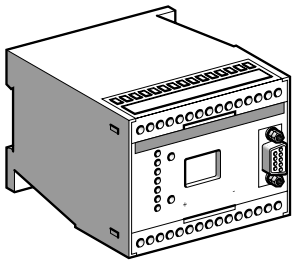
Module type		**XZ ML13212**	**XZ ML16212**
Product certifications		–	
Ambient air temperature around the device		Operation: 0…+ 55 °C. Storage: - 25…+ 85 °C	
Degree of protection		IP 20	
Vibration resistance		1 gn (f = 2…150 Hz) conforming to IEC 68-2-6	
Shock resistance		30 gn, 11 ms, conforming to IEC 68-2-27	
Number of slaves which can be connected		1…31 AS-Interface slaves	
Connection to AS-Interface		By screw terminals 2 x 1.5 mm², with cable ends	
Link to the supervisor	Protocol	Modbus	Modbus Plus
	Type	RS 485	
	Number	1	
	Speed	1.2…57.6 K Bauds	1 M bits/s
	Multiplexing	Yes, 64 addresses	
	Connection	By 9-pin SUB-D connector	
Power supply	Type	External regulated (type N) (see connections page 4/37)	
	Current	70 mA on the line. 150 mA external supply	
	Voltage	See connections page 4/37	
	Connection	By screw terminals 1 x 1.5 mm², with cable ends	
Diagnostics		–	By the line
Indication		By LED and 2 x 7 segment display, for diagnostics and maintenance	

AS-Interface cabling system

Installation system

Modbus/Modbus Plus gateway modules for AS-Interface line

References



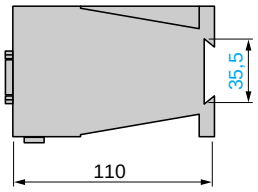
XZ ML1●●●●

Description	Protocol	Link	Power supply	Reference	Weight kg
Gateway modules	Modbus	RS 232C	From the line (type A)	**XZ ML12222**	0.450
		RS 485	External (type N)	**XZ ML13212**	0.450
	Modbus plus	RS 485	From the line (type A)	**XZ ML16222**	0.450
			External (type N)	**XZ ML16212**	0.450

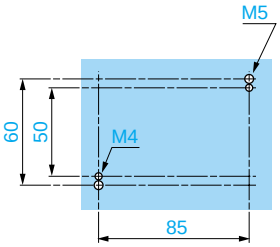
Dimensions

XZ ML1●●●●

Mounting on 35 mm ⊓ rail



Panel mounting

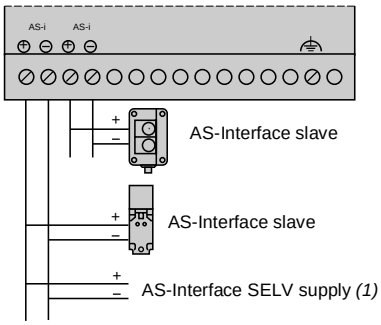


Connections

Power supply terminals

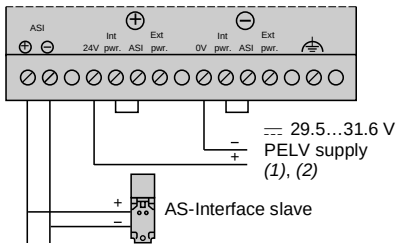
XZ ML12222, ML16222

Supply from the line



XZ ML13212, ML16212

External supply for line + master

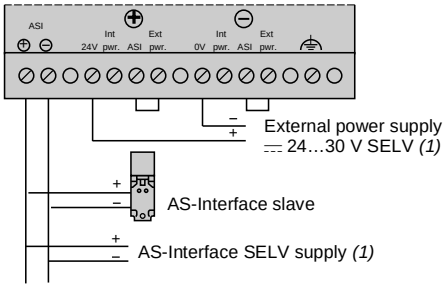


Nota : *this supply method is inadequate for use of the AS-Interface insulation monitor*

XZ ML13212, ML16212

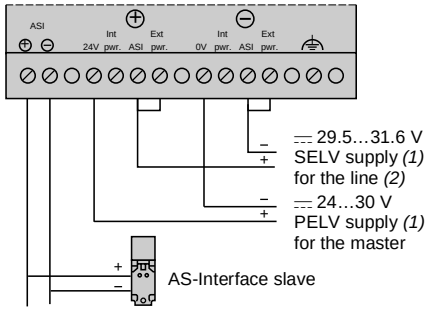
Separate power supplies

AS-Interface for the line, external for the master



XZ ML13212, ML16212

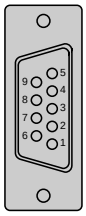
External power supplies



Connector

on XZ ML1●●●●

RS 232C or RS 485 link

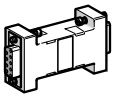


RS 232C
2 ➡ TXD (transmit)
3 ➡ RXD (receive)
5 ➡ 0 V (common)

RS 485
3 ➡ A (signal A)
8 ➡ B (signal B)

(1) SELV: Safety Extra Low Voltage, PELV: Protective Extra Low Voltage.
(2) ***Warning****: current consumption on the AS-Interface line must not exceed 2 A otherwise the master will be destroyed.*

AS-Interface cabling system
Installation system
Modbus/Modbus Plus gateway modules for AS-Interface line



XZ-MG5●

Connection accessories

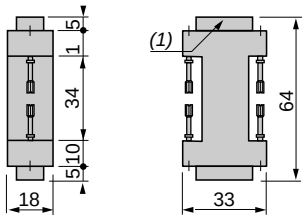
Description	Type of supervisor	Master link type	Application Cable length	Reference	Weight kg
Connection cables for gateway modules XZ ML●●●●● (see schemes below)	PC	RS 232 C	PC⟷XZ ML L = 2.5 m	**XBT ZA1**	0.210
		RS 485 *(1)*	PC⟷XZ MG51 L = 1.5 m	**XZ MG21**	0.100
	XBT H/P/E *(2)*	RS 232 C or RS 485	XBT⟷XZ ML L = 2.5 m	**XBT Z900**	0.410

Description	Reference	Weight kg
Line adapter RS 232 C/RS 485, Modbus (supplied by the RS 232 C link)	**XZ MG51**	0.040
Line adapter RS 232 C/RS 485, Profibus (supplied by the RS 232 C link)	**XZ MG52**	0.040
Connector adapter RJ 45/SUB-D 9-pin, male, configurable	**XGV SZ0920**	0.020

(1) When connecting an XZ ML●●●●● gateway module with an RS 485 link to a PC, it is necessary to insert an RS 232 C/RS 485 line adapter XZ MG51 or XZ MG52 (see above).
(2) XBT H/P/E addressing terminal connecting cables are fitted with an RJ 45 Jack connector. To connect these cables to the 9-pin SUB-D connector of an XZ ML●●●●● gateway module, it is necessary to use an RJ 45/SUB-D connector adapter XGV SZ0920 (see above).

Dimensions

XZ MG51, XZ MG52



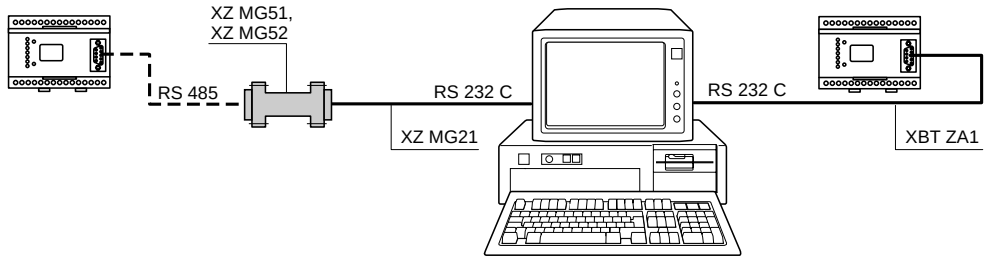
(1) 9-pin DIN connector

AS-Interface cabling system

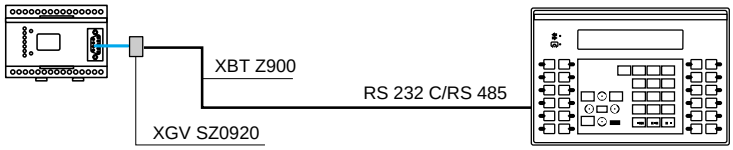
Installation system

Modbus/Modbus Plus gateway modules
for AS-Interface line

Connection of XZ ML●●●●● gateway modules to PC



Connection of XZ ML●●●●● gateway modules to XBT H/P/E addressing terminal



Configured according to the type of link
(see table below)

Configuration of connector adapter XGV SZ0920

Type of link		RJ 45 connector wire	SUB-D connector pin
RS 232 C	TXD	Red	2
	RXD	Green	3
	0 V	Black	5
RS 485	A	Blue	3
	B	Orange	8

Contents

5 - AS-Interface tools

Selection guide for terminals . . . . . page 5/2

■ AS-Interface Design installation configuration software . . . . . *page 5/4*

■ AS-Interface V1 and V2.1 terminals . . . . . *page 5/4*

AS-Interface cabling system
Tools

Description	AS-Interface addressing terminal
Functions	Allows addressing of AS-Interface V1 and V2.1 slaves
Power supply	For re-chargeable battery
Operating time	250 read/write operations
Display	13 mm LCD screen
Type	XZ MC11
Pages	5/4

AS-Interface adjustment terminal

Allows addressing of AS-Interface V1 and V2.1 slaves, and testing of AS-Interface inputs/outputs under power
Allows diagnostics of AS-Interface slaves

LR6 batteries

2500 addressing operations

25 mm LCD screen

ASI TERV2

5/4

AS-Interface cabling system

Tools

AS-Interface Design installation configuration software

Terminals

AS-Interface Design installation configuration software

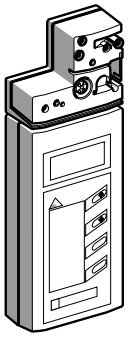
Description	Reference	Weight kg
Supplied on CD-ROM (PC)	**SIS CD 2020002**	0.090

Terminal characteristics

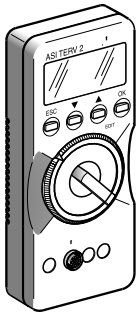
Terminal type		XZ MC11	ASI TERV2
Ambient air temperature around the device	**°C**	Operation : 0…+ 55, storage : - 20…+ 55	
Degree of protection		IP 20	IP 40
Supply		Rechargeable batteries	LR6 batteries
Recharging time	**h**	14	–
Operating time		250 read/write operations	2500 addressing operations
Display	**mm**	LCD screen, 13	LCD screen, 25
Keypad		Membrane 4 keys	Selector switch + 4 keys
Connection		To AS-Interface slave by infrared with cable **ASI TERIR1**, or direct using cable **XZ MG1●** or **ASI TERACC●●**	
Overload and short-circuit protection		Yes	

5

Terminal references



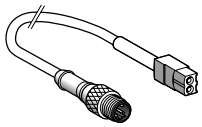
XZ MC11



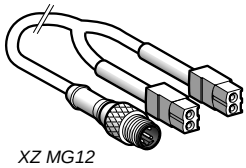
ASI TERV2

Description	Reference	Weight kg
Addressing terminal Battery operated. Battery charger supplied. AS-Interface V1 and V2.1 compatible	**XZ MC11**	0.550
Adjustment terminal Runs on LR6 batteries. Allows addressing of AS-Interface V1 and V.2.1 slaves and diagnostics	**ASI TERV2**	0.500
Case containing : ASI TERV2 adjustment terminal + cables ASI TERACC1M, ASI TERACC1F, ASI TERACC2, XZ MG12, XZ MG13, ASI TERIR1 + protective cover	**ASI TERV2SET**	1.000

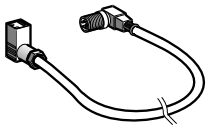
Accessories



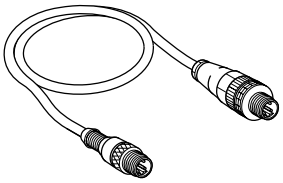
XZ MG11



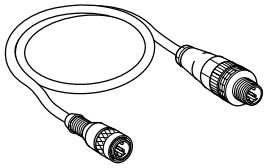
XZ MG12



ASI TERIR1



ASI TERACC1M



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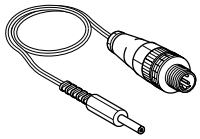
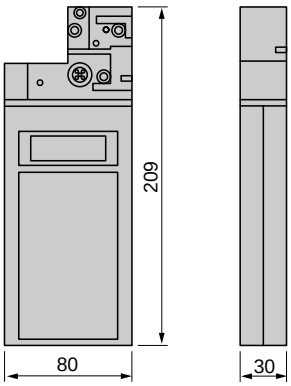


ASI TERACC2

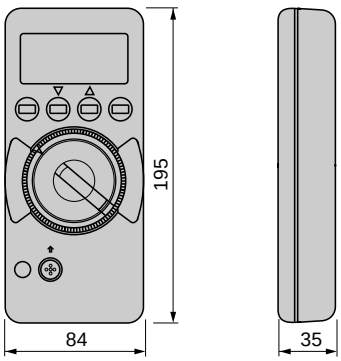
Description	For addressing	Reference	Weight kg
Cable adaptors for terminals XZ MC11 and ASI TERV2	Products with green terminal block (ABE 8●●, APP 1●●)	**XZ MG11**	0.070
	Products with green or yellow terminal block (ABE 8●●, APP 1●●, ASI LUF●●, ASI 20M●●)	**XZ MG12**	0.070
	Infrared (ASI SSL●●)	**ASI TERIR1**	0.070
	Products with M12 male connector	**ASI TERACC1M**	0.070
	Products with M12 female connector (XVB ●●, XAL ●●, LF● ●●, ASI 67FMP●●)	**ASI TERACC1F**	0.070
	Products with “Jack” plug (ASI 20M●●, ASI 67FFP●●)	**ASI TERACC2**	0.070

Dimensions

XZ MC11



ASI TERV2



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- Product standards and certifications . . . . . *page 6/4*
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Depending on the climatic and environmental conditions in which the equipment is placed, Schneider Electric can offer specially adapted products to meet your requirements.

In order to make the correct choice of protective finish, two points should be remembered:
- the prevailing climate of the country is never the only criterion,
- only the atmosphere in the immediate vicinity of the equipment need be considered.

All climates treatment “TC”

This is the standard treatment for Telemecanique brand equipment and is suitable for the vast majority of applications. It is the equivalent of treatments described as “Klimafest”, “Climateproof”.
In particular, it meets the requirements specified in the following publications:
- Publication UTE C 63-100 (method I), successive cycles of humid heat at:
+ 40 °C and 95 % relative humidity.
- DIN 50016 - Variations of ambient conditions within a climatic chamber:
+ 23 °C and 83 % relative humidity,
+ 40 °C and 92 % relative humidity.

It also meets the requirements of the following marine classification societies:
BV-LR-GL-DNV-RINA.

Characteristics

- Steel components are usually treated with zinc chromate. When they have a mechanical function, they may also be painted.
- Insulating materials are selected for their high electrical, dielectric and mechanical characteristics.
- Metal enclosures have a stoved paint finish, applied over a primary phosphate protective coat, or are galvanised (e.g. some prefabricated busbar trunking components).

Limits for use of “TC” (All climates) treatment

- “TC” treatment is suitable for the following temperatures and humidity:

Temperature (°C)	**Relative humidity** (%)
20	95
40	80
50	50

“TC” treatment is therefore suitable for all latitudes and in particular tropical and equatorial regions where the equipment is mounted in normally ventilated industrial premises. Being sheltered from external climatic conditions, temperature variations are small, the risk of condensation is minimised and the risk of dripping water is virtually non-existent.

Extension of use of “TC” (All climates) treatment

In cases where the humidity around the equipment exceeds the conditions described above, or in equatorial regions if the equipment is mounted outdoors, or if it is placed in a very humid location (laundries, sugar refineries, steam rooms, etc.), “TC” treatment can still be used if the following precautions are taken:
- The enclosure in which the equipment is mounted must be protected with a “TH” finish (see next page) and must be well ventilated to avoid condensation and dripping water (e.g. enclosure base plate mounted on spacers).
- Components mounted inside the enclosure must have a “TC” finish.
- If the equipment is to be switched off for long periods, a heater must be provided (0.2 to 0.5 kW per square decimetre of enclosure), that switches on automatically when the equipment is turned off. This heater keeps the inside of the enclosure at a temperature slightly higher than the outside surrounding temperature, thereby avoiding any risk of condensation and dripping water (the heat produced by the equipment itself during normal running is sufficient to provide this temperature difference).
- Special considerations for "Dialogue" and "Detection" products:
for certain pilot devices, the use of “TC” treatment can be extended to outdoor use provided their enclosure is made of light alloys, zinc alloys or plastic material. In this case, it is also essential to ensure that the degree of protection against penetration of liquids and solid objects is suitable for the applications involved.

"TH" treatment for hot and humid environments

This treatment is suitable for hot and humid atmospheres where installations are regularly subject to condensation, dripping water and the risk of fungi.

In addition, plastic insulating components are resistant to attacks from insects such as termites and cockroaches. These properties have often led to this treatment being described as "Tropical Finish", but this does not mean that all equipment installed in tropical and equatorial regions must systematically have undergone "TH" treatment. On the other hand, certain operating conditions in temperate climates may well require the use of "TH" treated equipment (see limitations for use of "TC" treatment).

Special characteristics of "TH" treatment

■ All insulating components are made of materials which are either resistant to fungi or treated with a fungicide, and which have increased resistance to creepage (Standards IEC 60112, NF C 26-220, DIN 5348).
■ Metal enclosures receive a top-coat of stoved, fungicidal paint, applied over a rust inhibiting undercoat. Components with "TH" treatment may be subject to a surcharge *(1)*. Please consult your Regional Sales Office.

Protective treatment selection guide

Surrounding environment	Duty cycle	Internal heating of enclosure when not in use	Type of climate	Protective treatment	
				of equip-ment	of enclo-sure
Indoors					
No dripping water or condensation	Unimportant	Not necessary	Unimportant	"TC"	"TC"
Presence of dripping water or condensation	Frequent switching off for periods of more than 1 day	No	Temperate	"TC"	"TH"
			Equatorial	"TH"	"TH"
		Yes	Unimportant	"TC"	"TH"
	Continuous	Not necessary	Unimportant	"TC"	"TH"
Outdoors (sheltered)					
No dripping water or dew	Unimportant	Not necessary	Temperate	"TC"	"TC"
			Equatorial	"TH"	"TH"
Exposed outdoors or near the sea					
Frequent and regular presence of dripping water or dew	Frequent switching off for periods of more than 1 day	No	Temperate	"TC"	"TH"
			Equatorial	"TH"	"TH"
		Yes	Unimportant	"TC"	"TH"
	Continuous	Not necessary	Unimportant	"TC"	"TH"

These treatments cover, in particular, the applications defined by methods I and II of guide UTE C 63-100.

Special precautions for electronic equipment

Electronic products always meet the requirements of "TC" treatment. A number of them are "TH" treated as standard.

Some electronic products (for example: programmable controllers, flush mountable controllers CCX and flush mountable operator terminals XBT) require the use of an enclosure providing a degree of protection to at least IP 54, as defined by standards IEC 60664 and NF C 20 040, for use in industrial applications or in environmental conditions requiring "TH" treatment.

These electronic products, including flush mountable products, must have a degree of protection to at least IP 20 (provided either by their own enclosure or by their installation method) for restricted access locations where the degree of pollution does not exceed 2 (a test booth not containing machinery or other dust producing activities, for example).

Special treatments

For particularly harsh industrial environments, Schneider Electric is able to offer special protective treatments. Please consult your Regional Sales Office.

(1) A large number of the Telemecanique brand products are "TH" treated as standard and are, therefore, not subject to a surcharge.

Standardisation

Conformity to standards

Telemecanique brand products satisfy, in the majority of cases, national (for example: BS in Great Britain, NF in France, DIN in Germany), European (for example: CENELEC) or international (IEC) standards. These product standards precisely define the performance of the designated products (such as IEC 60947 for low voltage equipment).
When used correctly, as designated by the manufacturer and in accordance with regulations and correct practices, these products will allow users to build equipment, machine systems or installations that conform to their appropriate standards (for example: IEC 60204-1, relating to electrical equipment used on industrial machines).
Schneider Electric is able to provide proof of conformity of its production to the standards it has chosen to comply with, through its quality assurance system.
On request, and depending on the situation, Schneider Electric can provide the following:

- a declaration of conformity,
- a certificate of conformity (ASEFA/LOVAG),
- a homologation certificate or approval, in the countries where this procedure is required or for particular specifications, such as those existing in the merchant navy.

Code	Certification authority		Country
	Name	Abbreviation	
ANSI	American National Standards Institute	ANSI	USA
BS	British Standards Institution	BSI	Great Britain
CEI	Comitato Elettrotecnico Italiano	CEI	Italy
DIN/VDE	Verband Deutscher Electrotechniker	VDE	Germany
EN	Comité Européen de Normalisation Electrotechnique	CENELEC	Europe
GOST	Gosudarstvenne Komitet Standartov	GOST	Russia
IEC	International Electrotechnical Commission	IEC	Worldwide
JIS	Japanese Industrial Standard	JISC	Japan
NBN	Institut Belge de Normalisation	IBN	Belgium
NEN	Nederlands Normalisatie Institut	NNI	Netherlands
NF	Union Technique de l'Electricité	UTE	France
SAA	Standards Association of Australia	SAA	Australia
UNE	Asociacion Española de Normalizacion y Certificacion	AENOR	Spain

European EN standards

These are technical specifications established in conjunction with, and with approval of, the relative bodies within the various CENELEC member countries (European Union, European Free Trade Association and many central and eastern European countries having «member» or «affiliated» status). Prepared in accordance with the principle of consensus, the European standards are the result of a weighted majority vote. Such adopted standards are then integrated into the national collection of standards, and contradictory national standards are withdrawn.
European standards incorporated within the French collection of standards carry the prefix NF EN. At the 'Union Technique de l'Electricité' (*Technical Union of Electricity*) (UTE), the French version of a corresponding European standard carries a dual number: European reference (NF EN …) and classification index (C …).
Therefore, the standard NF EN 60947-4-1 relating to motor contactors and starters, effectively constitutes the French version of the European standard EN 60947-4-1 and carries the UTE classification C 63-110.
This standard is identical to the British standard BS EN 60947-4-1 or the German standard DIN EN 60947-4-1.
Whenever reasonably practical, European standards reflect the international standards (IEC).
With regard to automation system components and distribution equipment, in addition to complying with the requirements of French NF standards, Telemecanique brand components conform to the standards of all other major industrial countries.

Regulations

European Directives

Opening up of European markets assumes harmonisation of the regulations pertaining to each of the member countries of the European Union.
The purpose of the European Directive is to eliminate obstacles hindering the free circulation of goods within the European Union, and it must be applied in all member countries. Member countries are obliged to transcribe each Directive into their national legislation and to simultaneously withdraw any contradictory regulations. The Directives, in particular those of a technical nature which concern us, only establish the objectives to be achieved, referred to as "essential requirements".
The manufacturer must take all the necessary measures to ensure that his products conform to the requirements of each Directive applicable to his production.
As a general rule, the manufacturer certifies conformity to the essential requirements of the Directive(s) for his product by affixing the CE mark.
The CE mark is affixed to Telemecanique brand products concerned, in order to comply with French and European regulations.

Significance of the CE mark

- The CE mark affixed to a product signifies that the manufacturer certifies that the product conforms to the relevant European Directive(s) which concern it; this condition must be met to allow free distribution and circulation within the countries of the European Union of any product subject to one or more of the E.U. Directives.
- The CE mark is intended solely for national market control authorities.
- The CE mark must not be confused with a conformity marking.

European Directives (continued)

For electrical equipment, only conformity to standards signifies that the product is suitable for its designated function, and only the guarantee of an established manufacturer can provide a high level of quality assurance.
For Telemecanique brand products, one or several Directives are likely to be applicable, depending on the product, and in particular:

- the Low Voltage Directive 73/23/EEC amended by Directive 93/68/EEC: the CE mark relating to this Directive has been compulsory since 1st January 1997.
- the Electromagnetic Compatibility Directive 89/336/EEC, amended by Directives 92/31/EEC and 93/68/EEC: the CE mark on products covered by this Directive has been compulsory since 1st January 1996

ASEFA-LOVAG certification

The function of ASEFA (Association des Stations d'Essais Française d'Appareils électriques - *Association of French Testing Stations for Low Voltage Industrial Electrical Equipment*) is to carry out tests of conformity to standards and to issue certificates of conformity and test reports.
ASEFA laboratories are authorised by the French authorisation committee (COFRAC).
ASEFA is now a member of the European agreement group LOVAG (Low Voltage Agreement Group). This means that any certificates issued by LOVAG/ASEFA are recognised by all the authorities which are members of the group and carry the same validity as those issued by any of the member authorities.

Quality labels

When components can be used in domestic and similar applications, it is sometimes recommended that a "Quality label" be obtained, which is a form of certification of conformity.

Code	Quality label	Country
CEBEC	Comité Electrotechnique Belge	Belgium
KEMA-KEUR	Keuring van Electrotechnische Materialen	Netherlands
NF	Union Technique de l'Electricité	France
ÖVE	Österreichischer Verband für Electrotechnik	Austria
SEMKO	Svenska Electriska Materiel Kontrollanatalten	Sweden

Product certifications

In some countries, the certification of certain electrical components is a legal requirement. In this case, a certificate of conformity to the standard is issued by the official test authority.
Each certified device must bear the relevant certification symbols when these are mandatory:

Code	Certification authority	Country
CSA	Canadian Standards Association	Canada
UL	Underwriters Laboratories	USA

Note on certifications issued by the Underwriters Laboratories (UL). There are two levels of approval:

"Recognized" ( ) The component is fully approved for inclusion in equipment built in a workshop, where the operating limits are known by the equipment manufacturer and where its use within such limits is acceptable by the Underwriters Laboratories.
The component is not approved as a "Product for general use" because its manufacturing characteristics are incomplete or its application possibilities are limited.
A "Recognized" component does not necessarily carry the certification symbol.

"Listed" (UL) The component conforms to all the requirements of the classification applicable to it and may therefore be used both as a "Product for general use" and as a component in assembled equipment. A "Listed" component must carry the certification symbol.

Marine classification societies

Prior approval (= certification) by certain marine classification societies is generally required for electrical equipment which is intended for use on board merchant vessels.

Code	Classification authority	Country
BV	Bureau Veritas	France
DNV	Det Norske Veritas	Norway
GL	Germanischer Lloyd	Germany
LR	Lloyd's Register	Great Britain
NKK	Nippon Kaiji Kyokaï	Japan
RINA	Registro Italiano Navale	Italy
RRS	Register of Shipping	Russia

Note

For further details on a specific product, please refer to the "Characteristics" pages in this catalogue or consult your Regional Sales Office.

Degrees of protection against the penetration of solid bodies, water and personnel access to live parts

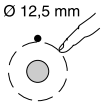
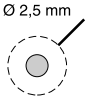
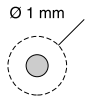
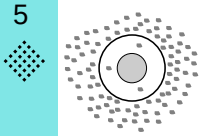
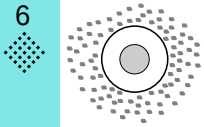
The European standard EN 60529 dated October 1991, IEC publication 529 (2nd edition - November 1989), defines a coding system (IP code) for indicating the degree of protection provided by electrical equipment enclosures against accidental direct contact with live parts and against the ingress of solid foreign objects or water.
This standard does not apply to protection against the risk of explosion or conditions such as humidity, corrosive gasses, fungi or vermin.
Certain equipment is designed to be mounted on an enclosure which will contribute towards achieving the required degree of protection (example : control devices mounted on an enclosure).
Different parts of an equipment can have different degrees of protection (example : enclosure with an opening in the base).
Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.
Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

IP ●●● code

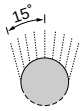
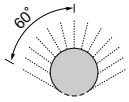
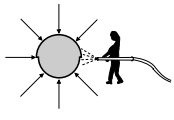
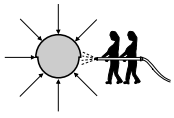
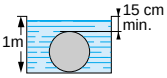
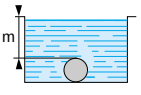
The IP code comprises **2 characteristic numerals** (e.g. **IP 55**) and may include **an additional letter** when the actual protection of personnel against direct contact with live parts is better than that indicated by the first numeral (e.g. IP 20C).

Any characteristic numeral which is unspecified is replaced by an X (e.g. IP XXB).

1st characteristic numeral : corresponds to **protection of the equipment against penetration of solid objects** and **protection of personnel against direct contact with live parts.**

		Protection of the equipment	Protection of personnel
0		Non-protected	Non-protected
1		Protected against the penetration of solid objects having a diameter greater than or equal to 50 mm.	Protected against direct contact with the back of the hand (accidental contacts).
2		Protected against the penetration of solid objects having a diameter greater than or equal to 12.5 mm.	Protected against direct finger contact.
3		Protected against the penetration of solid objects having a diameter greater than or equal to 2.5 mm.	Protected against direct contact with a Ø 2.5 mm tool.
4		Protected against the penetration of solid objects having a diameter > 1 mm.	Protected against direct contact with a Ø 1 mm wire.
5		Dust protected (no harmful deposits).	Protected against direct contact with a Ø 1 mm wire.
6		Dust tight.	Protected against direct contact with a Ø 1 mm wire.

2nd characteristic numeral : corresponds to **protection of the equipment against penetration of water with harmful effects.**

0	Non-protected	
1		Protected against vertical dripping water, (condensation).
2		Protected against dripping water at an angle of up to 15°.
3		Protected against rain at an angle of up to 60°.
4		Protected against splashing water in all directions.
5		Protected against water jets in all directions.
6		Protected against powerful jets of water and waves.
7		Protected against the effects of temporary immersion.
8		Protected against the effects of prolonged immersion under specified conditions.

Degrees of protection against mechanical impact

The European standard EN 50102 dated March 1995 defines a coding system (IK code) for indicating the degree of protection provided by electrical equipment enclosures against external mechanical impact.
Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.
Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

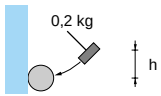
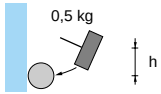
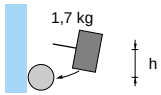
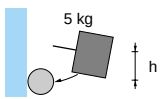
Additional letter : corresponds to **protection of personnel against direct contact with live parts**.

A	With the back of the hand.
B	With the finger.
C	With a Ø 2.5 mm tool.
D	With a Ø 1 mm wire.

IK ●● code

The IK code comprises **2 characteristic numerals** (e.g. **IK 05**).

2 characteristic numerals : corresponding to a **value of impact energy**.

		h (cm)	Energy (J)
00	Non-protected		
01		7.5	0.15
02		10	0.2
03		17.5	0.35
04		25	0.5
05		35	0.7
06		20	1
07		40	2
08		30	5
09		20	10
10		40	20

Schneider Electric worldwide

Up-dated: 30-07-2003

Afghanistan	Contacts are assured by	**Schneider Electric India**		
Albania	Contacts are assured by	**Schneider Electric Austria**		
Algeria	■ Schneider Electric	voie A Lot C22 Zone industrielle Rouiba - Alger	Tel. : +213 21 92 97 02 à 09 Fax : +213 21 92 97 00 à 01	
Andorra	Contacts are assured by	**Schneider Electric France**		
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Anguilla	Contacts are assured by	**Schneider Electric Dominican Rep.**		
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